

# The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. XXII. No. 562

APRIL 5, 1930

Prepaid Annual Subscription:  
United Kingdom, £1.1.0; Abroad, £1.4.0

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**NOTICES:**—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Benn Brothers, Ltd., proprietors of THE CHEMICAL AGE, have for some years past adopted the five-day week, and the editorial and general offices (Bouverie House, 154, Fleet Street, London, E.C.4), are closed on Saturdays.

Telegrams: "Allangas, Fleet, London."

Telephone: City 0244

## Chemical Engineers in Conference

THE eighth annual corporate meeting of the Institution of Chemical Engineers, held this week in London, is a reminder of the pace at which the organisation is growing up and of the important position it has attained so early in its career. The proceedings this year began with a particularly comprehensive paper on "Pulverised Fuel," presented by Dr. J. T. Dunn and Dr. Burrows Moore. The annual business meeting was fixed for Friday morning, to be followed by the president's address. Mr. Reavell had chosen a favourite subject—"The Role of Science in Industry"—and made it an opportunity for emphasising the importance of recognising and utilising the man of science as an essential factor in the conduct of industry. No better text for such a subject could be wished for than the recent appointment of Sir Harold Hartley to the board of the L.M.S. Rly. Co. and the nomination of a representative committee to act with him. A paper of great chemical engineering interest was that by Mr. H. Tongue, A.M.I.Mech.E., on "The high pressure equipment of the Chemical Research Laboratory, Teddington." Several papers have now been presented

by Dr. Morgan and members of his staff on the results of their research and on the methods and engineering equipment employed in the work. It is difficult to say which has been the more highly estimated—the actual results that have come to light or the accounts of the technical and engineering layout. Mr. Tongue's paper, of which some report will be available next week, maintains the standard set by his predecessors, and that praise should be adequate.

The award of medals this year was a new feature and one on which the Institution may be congratulated. The Moulton Medal has been awarded to the paper on "The recovery of benzol from coal gas, with particular reference to the use of active charcoal," by Mr. H. Hollings, Dr. S. Pexton, and Dr. R. Chaplin. The Junior Moulton Medal, together with a prize of books, goes to Mr. Harold Smith for "an investigation of the chemical and engineering possibilities arising in the design of a plant for the recovery of ammonia from the effluent gas of a cuprammonium canvas treating plant." Professor Hinchley, one of the early formative minds of the Institution and its present honorary secretary, receives the first Osborne Reynolds Medal. The meetings are in progress as we go to press, but there is little risk in predicting their complete success.

## "The Chemistry of War"

MAJOR F. A. FREETH's address at the Royal United Service Institution on "The Chemistry of War" may do something to diminish the extravagant fears of what "gas" means. In this respect, we believe, he is in agreement with General Fries, who organised the Chemical Warfare Service of the United States, and who discredited the popular idea that large communities could be wiped out wholesale. A widely read morning journal recently reproduced two sketches (highly imaginary) by a German artist of the effects of gas bombing. One of them depicted Ludgate Circus in a state in which no humane person desires to see that or any other circus. Major Freeth dismisses the picture as "absolute nonsense," and he adds rightly that the really serious effect of "all this imaginative press work upon gas" is upon the nerves of the civilian population. That, indeed, was the real effect of those pleasant visitations we endured night after night in the later stages of the war. The actual damage, though serious enough, was quite disproportionate to the amount of noise and the demoralising effects of sleepless nights. And when we began to pay return visits to the Rhine towns, the German population was influenced in much the same way. But since modern nations cannot get on without chemical works, they cannot dispossess themselves of the means of manufacturing chemical agents of war. The proposal to stop supplies is, as Major Freeth says, a poor thing to rely upon, for with

the advance of science such arguments become of less and less force, and allowance must always be made for the extraordinary resilience of the human—and especially of the chemical and engineering—mind in an emergency.

Putting aside all alarmist ideas, it remains true that what Major Freeth calls the "chemical potential" of Great Britain is almost immeasurably stronger than before the war. For example, the number of people chemically employed is vastly greater; the number of experts available has been at least quadrupled; chemical operations which before the war were unknown in this country are now in active commercial operation. Of the last, the synthetic nitrogen industry is the most conspicuous example; the dyestuffs industry comes next, and fine chemicals may also be included. Inevitably our resources for the manufacture of explosives—to say nothing of toxic gases—have greatly increased. It is estimated that during the war there were manufactured in Great Britain 68,500 tons of picric acid, 23,800 tons of T.N.T., 378,000 tons of ammonium nitrate, and 139,000 tons of cordite, making a total of 1,440,000 tons. Major Freeth's estimate is that to-day—if any such tragic necessity arose—two million tons freight at the very least would be saved on fixed nitrogen alone. It is at least a tribute to the pace at which chemical science and practice have advanced in the last decade and a half.

### Dyestuffs Progress

MR. PERCY ASHLEY, of the Board of Trade, is naturally precluded by his office from taking part in controversial matters, but occasionally an opportunity occurs of presenting his views, and they are always worth hearing for their knowledge and judgment. In his remarks to the Dyers and Colourists the other night in London, he drew attention to the pronounced modern vogue for colour and congratulated the colour industry on its efforts to satisfy this very wholesome demand. What, however, is most to be emphasised is his plea for comprehensive and whole-hearted co-operation among all sections of the industry—and especially for a strong dye-making industry in the closest possible co-operation with the colour users. It is, indeed, this latter condition that accounts for the success that has been achieved under the Dyestuffs Act, and that is urgently needed in any steps that may be taken at the end of the ten years for which the Act was passed. It is encouraging to be reminded that the 1928 output of dyestuffs was five and a half times that of 1913, and that the 1929 figures will probably show a further 10 per cent. increase. What is required for the future, in Mr. Ashley's estimate, is such a combination of quality of textile design, quality of dyestuffs and colouring matter, and quality of workmanship as will give our customers throughout the world a guarantee of quality in the goods offered to them.

### On Patent Law Reform

A VERY concise and useful memorandum on British patent law reform has just been compiled by a representative joint chemical committee for submission to the Board of Trade Patents Committee of 1929. Eight influential chemical organisations unanimously

endorse the views expressed in the memorandum, which may therefore be regarded as representing the common body of opinion held by most of those concerned in the practice of chemistry in Great Britain in respect of the reforms that seem desirable and practical in Patent Law and Practice. The memorandum is commendably brief and clear, and the various reforms suggested have been very carefully filtered from a mass of detail, and reduced to condensed terms. Nothing quite so thoroughly digested had previously appeared on this complicated subject.

Especially interesting is the committee's scheme for the dedication of medical patents, which has received long and careful consideration. The fact that the memorandum is the result of concerted action on the part of all the bodies representing the chemical industry is also notable since it marks a distinct step forward in the co-operation which is essential if the views of the chemical industry are to receive the attention they deserve. It may be added that a limited number of copies may be obtained from the Association of British Chemical Manufacturers, 166, Piccadilly, London, W.1, at a cost of one shilling.

### The Calendar

Apl. 7	Society of Chemical Industry (London Section): "Circumstantial Evidence from Fibres and Hairs." Dr. C. Ainsworth Mitchell. "Detection and Estimation of Small Quantities of Chlorine in Flour." Dr. D. W. Kent-Jones and Dr. C. W. Herd. 8 p.m.	Burlington House, Piccadilly, London.
8	Institution of Petroleum Technologists. 5.30 p.m.	John Street, Adelphi, London.
9	Institute of Chemistry (London Section): "The Medical Witness." Dr. R. M. Brontë. 7 p.m.	30, Russell Square, London.
9	Institute of Fuel: Annual Corporate Meeting. 6 p.m. "The Cracking of Oils with Special Reference to Low Temperature Tars." W. H. Jones. 6.10 p.m.	Burlington House, Piccadilly, London.
10	Optical Society: Annual General Meeting. 7.30 p.m.	Imperial College of Science and Technology, London. 83, Pall Mall, London.
10	Institute of Metals (London Section): Annual General Meeting. Open Discussion. 7.30 p.m.	Thomas's Café, High Street, Swansea.
10	Institute of Metals (Swansea Section): Annual General Meeting. Oil and Colour Chemists' Association: "Some Properties of Gels." E. Hatschek. 7.30 p.m.	30, Russell Square, London.
11	Chemical Engineering Group: General Discussion on "Asphalt as a Chemical Engineering Material." 8 p.m.	Burlington House, Piccadilly, London.
11	Institute of Metals (Sheffield Section): Annual General Meeting. "Refractories and their Uses." F. Russell. 7.30 p.m.	University, Sheffield
11	Society of Dyers and Colourists (Manchester Section): "Patent Law and the Dyer." C. Hollins. 7 p.m.	36, George Street, Manchester.
11	Institution of Chemical Engineers. Public Lecture: "The Fabrication of Acid-Resisting Steel Plant." Dr. W. H. Hatfield. 7 p.m.	Municipal College of Technology, Manchester.
16	Society of Glass Technology: Annual general meeting.	Sheffield.
25 & 26	Faraday Society. General Discussion on "Optical Rotatory Power." Annual General Meeting.	Burlington House, Piccadilly, London.
28	Oil and Colour Chemists' Association. Annual Dinner. 7 p.m.	Connaught Rooms, London.

## Another Evening with the Chemical Society

### Chemistry House Scheme: Foreign Greetings

A feature of the Chemical Society's annual dinner last week was a group of greetings from eminent foreign chemists, announced by Professor Thorpe from the chair. In the course of the speeches frequent reference was made to the chemical headquarters scheme and cordial approval expressed of its objects.

It seemed singularly appropriate that at the anniversary dinner of the Chemical Society, held at the Hotel Victoria, London, on Thursday evening, March 27, it should fall to the representative of the Deutsche Chemische Gesellschaft, Professor Georg von Hevesy, to pay to the Chemical Society the compliment that the guests on these happy occasions desire to have paid to it.

#### "These Beautiful Gatherings"

The chemical societies of the world, he reminded the company, have taken the Chemical Society of this country as their model. In particular, the German Society was founded by Hofmann on the very lines of the English society. The invitation to attend "these charming, these beautiful gatherings" was highly prized in Germany; the hospitality of British chemists had a sort of atmosphere and tradition of its own. They prized, too, the visits of British chemists to their own meetings; and, distinguished as their visitors in past years had been, by no one in the long and honourable list had the German Society been more impressed than by Sir Ernest Rutherford, their last visitor. Though Sir Ernest disclaimed the title of chemist, Professor von Hevesy confidently declared that since the time of Faraday no one had done more to advance the fundamental ideas of chemistry. Personally, he desired to express his deep sense of the kindness with which he had been received, as representing the German Chemical Society, by the President and all his colleagues, and he conveyed to the Society in return the warmest greetings of his colleagues.

This gracious little speech, delivered in acknowledgment of the toast of "The Guests," proposed by Mr. Chaston Chapman in the happiest vein, fitted in very well with the postal and telegraphic greetings announced by Professor Thorpe from distinguished chemists abroad. These included Wilhelm Ostwald (whose letter, written in his own hand at the age of 76 years, is reproduced in *fac simile*), P. Debye, Leipzig; A. Hankzsch, Dresden; N. Bohr, Copenhagen; D. Langmuir, United States; O. Wallach, Göttingen; H. Wieland, Munich; and Einar Billmann, Copenhagen. All this gave an international touch to the proceedings, and implied a sort of homage to the mother chemical society of the world.

The attendance was, as usual, representative and distinguished; yet the atmosphere was wholly free from restrictive formality. The speaking went on until after ten o'clock; good speaking that bored nobody and had an agreeable flavour of humour and good fellowship, even when it was concerned with serious topics. Professor von Hevesy was nearer the truth even than he realised in his tribute to the social and intellectual qualities of these Chemical Society gatherings.

#### "The Chemical Society"

The toast of "The Chemical Society" was proposed by Sir David Milne-Watson, who disclaimed any right to speak about chemistry in a speech that promptly demolished his own disclaimer. It was occupied largely by acknowledgments of the debt that science and industry owed to the work of the Chemical Society, in such branches as the publication of chemical abstracts, enabling students to keep abreast of the latest knowledge. As the head of a great gas concern, which

was fundamentally a chemical business, he appreciated how difficult it was for industry to keep pace with the rapid advance of knowledge that was proceeding throughout the world, and the enormous advantages the Society rendered to industries dependent on science. There was no doubt that in the science and applications of chemistry lay the solution of some of the greatest problems that faced mankind. Speaking as President of the Institute of Fuel and as the head of a great unit in the gas industry, he resented the suggestion that the gas industry was an interloper and a parasite between the coal industry and the consumer. The gas industry had been built up on the researches and discoveries of its own chemists, and it was due to them that coal to-day, through the development of its by-products, was so enormously more valuable and important than when it was merely burnt in its raw state. The suggestion that they were interlopers and parasites—especially in view of their very modest dividends—was one he very much resented. He concluded by expressing his entire sympathy with the central building scheme, which had been so admirably explained to them that afternoon by Professor Thorpe.

#### The President's Reply

The President, in his reply, stated that it was intended to invite to that dinner various German and other foreign members, but for one reason or another they had been unable to attend. The German Chemical Society, which was asked to send a representative to speak, had chosen a very distinguished chemist in the person of Professor von Hevesy, whom they very cordially welcomed and whose lecture on the previous day had been deeply appreciated. Professor Thorpe read the messages already referred to received from the chemists of other nations, and also welcomed two Nobel prizemen present, Sir Gowland Hopkins and Professor Harden.

Touching on the Chemistry House scheme, he said the Chemical Society were obliged to leave their premises because they had outgrown them. "We cannot expand further," said Professor Thorpe gravely, "without bursting out the walls." The company unfeelingly perverted this into a personal con-

FACSIMILE COPY OF DR. OSTWALD'S LETTER  
TO THE CHEMICAL SOCIETY:

31.1.30

Hochgeachteter Herr Kollege:  
Vielen Dank für die freundliche Einladung. Ich bitte Sie, gelegentlich der Chemical Society meine herzlichsten Grüsse zu sagen. Persönlich kann ich dies leider nicht tun, da meine 76 Jahre mich zu schwer beweglich gemacht haben und ich insbesondere die bedenkliche Jahreszeit scheue.

Ihr ganz ergebener

W. Ostwald



fession, and roared with laughter. After this, it became very difficult indeed to recover a truly serious mood, for the company insisted on seeing a humorous intent in the President's most sober remarks. We gathered, however, that it was with great regret that the Chemical Society are leaving the beautiful rooms they have occupied for 55 years, and seeking other quarters in Westminster, a district, as the President remarked, occupied mainly by engineers and politicians.

#### "The Central Building"

The toast of "The Central Building"—which he pointed out should not be confused with central heating—was proposed by Dr. Herbert Levinstein, who began with an interesting characterisation of the President. When he knew Professor Thorpe first, he said, he was a finished cricketer and a distinguished organic chemist. He was now a completely finished cricketer and a very finished, but not quite completely finished, organic chemist. Speaking of the central building idea, he expressed his substantial agreement with the scheme so admirably outlined by Professor Thorpe and referred to the practical advantages that might be expected from it. The societies, he said, were losing many members owing to the centralisation of factories and businesses, and it was the practice of the young chemist to use the works library, in his employer's time and at his employer's expense, to keep himself up to date. His view was that the works library was provided for the purpose of enabling the chemist to consult the literature of any subject he was told to work on, and that it was the

duty of the chemist to keep himself abreast of general literature at his own cost. To-day work was over by about five o'clock, but he was quite sure that the chemical industries of this country had not been built up on chemical work of that kind. Although, he added, the Institute of Chemistry was at present outside the central building scheme, he predicted that in time the Institute would also come in, and that the proposed reduced fee for all societies would be a great inducement to all chemists to join.

Sir Arnold Wilson, who has taken so much interest in the scheme, responded, paying a generous tribute to the work of Professor Thorpe in reducing the details to order and to Mr. Carr, the assistant secretary of the Chemical Society. He regarded as among the greatest advantages of the scheme, the bringing of the producer societies into contact with the scientific and technical societies, the reduction in the cost of membership to the young chemist, the reduction in the costs of production of the journals, and accessibility to a great central library that might be in a position to lend works for the study of the student at home. That was the first occasion on which the toast of "The Central Building" had ever been proposed, and he predicted that in another ten years' time that would be regarded as a memorable incident and occasion.

The last toast was that of "The Guests" proposed, as already stated, by Mr. Chaston Chapman, and responded to by Mr. C. A. Hill (British Drug Houses), in addition to Professor von Hevesy.

## Factors in the Use of Pulverised Fuel

By J. T. Dunn and Burrows Moore

*The following are extracts from a paper on "Pulverised Fuel," which was read at the eighth annual corporate meeting of the Institution of Chemical Engineers on Thursday.*

AMONG the properties which govern largely the choice of a fuel to be used in powdered form, the capacity for being broken and ground to a powder is important for several reasons. It determines the power which must be expended in reducing the fuel to the required degree of fineness, it may render a fuel unsuitable for use with other firing methods—mechanical stoking—on account of the fuel breaking so easily that excessive loss is incurred by its falling unburnt through the stoker-bed; and it may cause considerable loss by breakage during cleaning and handling operations.

The moisture in a solid fuel may be roughly classified as (a) normal, (b) in excess of normal. Normal moisture may be defined as the moisture which a fuel, originally dried, would absorb if it were kept in an atmosphere of moist air until a condition of equilibrium was attained between the water in the air and that in the fuel. A fuel with a moisture content of 12 per cent. may be usable without further drying, whilst one with a moisture content of 5 per cent. may require drying to remove 2 per cent. of moisture, if in the former case the moisture is normal whilst in the latter case the normal moisture content is only 3 per cent.

Ash content may be partly inherent and partly extraneous material. Various investigators have shown that with some fuels there is a grading during pulverising, whereby the mineral constituents are not uniformly distributed between the particles of different sizes, and with some coals the mineral constituents become concentrated in the larger particles, suggesting that the mineral constituents are less friable than the rest of the coal conglomerate. The ash may affect, either adversely or advantageously, the ignition and combustion of the fuel; extraneous dirt and mineral matter which form a mechanical mixture with the fuel tend, if in sufficient amount, to alter the ignition and combustion properties of the fuel.

The fusibility of the ash must be considered. The fusion point may be low enough to cause melted ash to accumulate on boiler tubes, which will tend to become corroded by the formation of corrosion couples from the ash coat falling off irregularly and producing areas of variable composition and "aeration," which become relatively anodic and cathodic areas. Further, the ash tends to react chemically, especially in the fused state, with the linings and brickwork of the combustion chambers. The incandescent ash particles act as sources which radiate their heat to the furnace or combustion chamber.

The increased efficiency of the contact between the fuel—

when in a powdered form—and air enables low-grade fuels with high ash content to be used. Solid fuels which have been used with success range from lignites to anthracite coals and cokes, including low quality fuel considered useless for firing by other methods. It is necessary to distinguish between powdered fuel obtained by pulverising and the dust left as residue from the grading of coal which has not been pulverised, which represents the more friable portions of the fuel consignment. Fractional separation will produce samples which will vary according to the relative friabilities of the banded ingredients, the ignition and combustion properties of which have been recently shown by Moore to differ considerably.

#### Theory and Mechanism of Combustion

In order that a particle of coal or other combustible may burn when in contact with air or oxygen, it must be heated up to the temperature known as its ignition point; and if we have a continuous supply of such particles continuous combustion is only possible when the heat given out during combustion by one particle is at least sufficient to raise the next particle to its ignition point, unless the particles of the surrounding air are at or above that temperature. The combustion of a particle of coal follows the same path as that of a larger piece. When the coal is heated its volatile matter is given off and a solid residue or coke remains behind. The combustion process is essentially one which involves the oxidation and decomposition of the fuel, the oxidation of its volatile decomposition products and of the solid residue. This process is accompanied by endothermic and exothermic reactions, which determine the resultant thermal value of the chemical changes which are involved. The combustion phase and the temperature attained within the combustion chamber will be determined by the difference in the rate of heat produced and the rate of heat loss; and the thermal stability and ignition properties of the fuel, the volatile distillation products, the oxidation products, and the solid residue. These variables depend on the chemical and physical constitution, the degree of fineness, the arrangement and method of using the fuel, the conditions of the surroundings, the oxygen supply, and the temperature. The combustion of a solid fuel in the form of a powder includes the oxidation and decomposition of the individual particles of the fuel and of the volatile products, as well as the effect of the chemical changes involved in the general mass of the powdered fuel.



When the particles are disseminated, as in the injection of a powdered coal and air mixture into a combustion chamber, the particles may be considered to retain their individuality more, and the chemical changes (and their thermal values) associated with every particle will tend to affect neighbouring particles less, as the dust cloud is the more dispersed. The chemical and physico-chemical reactions involved in the combustion of solid fuels are not fully understood, but they include a number of reversible chemical changes, which may proceed simultaneously, and the development of which is related to the pressure and temperature conditions as well as to the constitution of the fuel and to the air supply.

#### Crushing Machines

Suitable types of crushing machines are:—Jaw and gyratory crushers, breaking by continuous pressure, to handle material from 5 in. to 2-in. lumps, and reducing to  $\frac{1}{4}$ -in. lumps; disc crushers, which break by direct continuous pressure, and will handle pieces up to 6-in. size and crush to  $\frac{3}{8}$ -in. size; crushing rolls, which break by crushing and tearing, and will handle pieces not larger than 1 to 2 in., and reduce to 15-mesh size; rotary crushers, which break by crushing and shearing, and handle pieces not greater than 6 in., and reduce them to less than  $\frac{1}{4}$ -in. size; and centrifugal roll mills, which break by crushing and shearing, and handle pieces  $\frac{1}{2}$  to  $\frac{3}{4}$ -in. size and reduce to 200-mesh size. A recent form which has been developed is the (Loesche) Raymond-Lopulco mill. The principal advantages of this mill are that the wear and tear is less than in the original Raymond mill, and that it is possible to renew one roller which has become worn without disturbing the others.

Ball mills break by impact, crushing and shearing, and handle lumps 1 to 2-in. size and crush to 60-mesh size. Tube mills break by impact, crushing and shearing, handle lumps up to 1 to 2-in. size and reduce to 200-mesh size. Beaters break by impact, handle pieces of 2-in. size and reduce to 200-mesh size. The principal types of roller mills, ball and tube mills fulfil the requirements of pulverising solid fuel ranging from lignites to anthracites and cokes after they leave the drying units. The moisture handling capacity of ball and tube mills is low, and their noisy operation is a further disadvantage, but their maintenance cost is lower than for most other types. They are to be preferred for pulverising hard abrasive fuels, such as anthracite coal and cokes, with which occurs considerable wear on the material of the mill. Pulverisers of the "beater" type are largely used where a combined drier pulveriser unit is required and for systems dispensing with storage bins. Satisfactory operation of this type is dependent upon ample capacity, allowing for wear, being provided; parts subject to intense wear should be made renewable when possible and made of resistant materials such as manganese steel, chilled cast iron and heat-treated alloy steel.

#### Heat From Pulverising

The temperature of the air and coal is raised by the heat derived from pulverising effort. It has been calculated that if the whole of the energy spent in an efficient mill in grinding a ton of coal were converted into heat and used to heat the coal, it would raise its temperature by about 68° F. (38° C.). This heat will be dissipated by (a) the discharge of the powdered product, the evaporated moisture, carried out of the system by the air and the product, the vent air, radiation from the surfaces of the apparatus and pipes, the actual absorption of energy in the disintegration of the coal. Thus the actual rise of temperature is but slight.

Cement kilns are the earliest instance of pulverised fuel firing in industry. Here the problem is not that of effecting complete combustion in a confined space, but rather that of prolonging the flame so as to avoid too intense local heating. The long combustion chamber affords ample time for combustion to take place, and hence a fuel less finely pulverised can be used. The object is to attain a temperature near the mouth of the kiln sufficient to complete the chemical reaction between the materials, or, as in magnesite calcining kilns, to convert one form of substance into another molecular variety. Tube mills are very frequently used for powdering the fuel which is then conveyed directly to the burner. Provision is usually made for the air for combustion to be taken either direct from the atmosphere, from the drier, or

from the clinker cooler, which is driven from the same shaft as the kiln. Rotary kilns are now made up to 300 ft. in length and 10 ft. in diameter, and use power including clinker cooler up to 300 h.p.

#### Advantages of Powdered Fuel Firing

The combustion of powdered coal is easily regulable and under perfect control. Alteration in the rate of burning or the nature of the flame can be effected momentarily, and, on the other hand, a condition of things once set up is maintained steadily for long periods, automatically. Connected with this is the rapidity with which lighting or re-lighting, or the rise of the firing to full power, can be carried out, and the reduction of loadless losses—no fuel is used while the boiler is out of work, loss during the period is minimised, because the flues, and access of cold air to the boiler, can be completely shut off, and full fire can be almost instantaneously restored. There is to be taken into account not only the saving of labour in charging and stoking, but also the enhanced cleanliness and pleasantness of the boiler-house itself.

An advantage of quite a different character is the possibility of using in powdered form inferior fuels, low in calorific value, or high in ash. Such fuels, of course, cannot give the same result as those of higher quality. A larger quantity must be ground to obtain an equal number of potential heat units, and the material will probably, because of its ash, need the expenditure of more energy per ton to grind it; the temperature attainable by its combustion will not be so high, since more of the heat evolved is used up and carried away by the greater quantity of ash, and there will be more ash to remove. All these reasons will make the actual cost of preparing and using such a fuel greater than that needed for a better fuel, but the fact that such a fuel could not be used at all in ordinary work, and that for such work it is therefore not marketable, may bring down its price to such a level as will make it profitable to use it, in spite of the added working costs in doing so.

## Patent Law Reform Proposals

### Chemical Committee's Recommendations

THE Joint Chemical Committee which has been considering Patent Law matters has now published a memorandum on Patent Law Reform, from the point of view of chemistry, pure and applied, and a limited number of copies, at 1s. each, may be obtained from the Association of British Chemical Manufacturers, 186, Piccadilly, London. The conclusions of the committee are endorsed by the Association of British Chemical Manufacturers, the Chemical Society, the Faraday Society, the Federal Council for Chemistry, the Institute of Chemistry, the Institution of Chemical Engineers, the Society of Chemical Industry, and the Society of Dyers and Colourists. The committee record their appreciation of the work already done by the British Science Guild, whose report has formed to a large extent the basis on which they have worked. The committee have grouped their recommendations into three categories, major proposals, minor proposals and controversial proposals on which they do not agree wholly or in part with the views of the Guild.

#### Time Limits for Applications

The proposal of the Guild that the period for filing a complete specification should be increased from nine to twelve months, and that the normal period allowed for acceptance of the complete specification should be increased consequently from fifteen to eighteen months, with extensions on payment of fees up to a total of twenty-one months is endorsed.

The committee consider that the proposals contained in the Guild report, covering the extension of the Patent Office search to documents other than British specifications are likely to be very useful, and endorse them. In any case the examiners should be empowered forthwith to cite any publications, other than British specifications, of which they are aware.

#### Selection Patents

In view of the increasing leniency in the granting of selection patents during recent years, and the expense involved in contesting them in the Courts, the committee recommend that the Comptroller's hands be strengthened by the insertion into

the Acts of an amendment embodying the decisions of the House of Lords and the Court of Appeal in the Clyde Nail case and *Sharpe and Dohme v. Boots*. It is suggested that this amendment might take the form of a new subsection in Sections 7 and 8:—(a) "Where on investigation under this or the last preceding section it appears that the application is for species or series of species lying within the generic terms of a prior document, the Comptroller shall not for this reason refuse to grant a patent if the selection of species is the result of an inventive act leading directly to stated advantage or avoidance of disadvantage" or (b) "An invention shall not be deemed not to have been wholly described or claimed by reason only of the fact that it consists in the selection of specific materials, agencies or means included generally but not specifically named in the prior document."

#### Reduction of Costs of Litigation

While still favouring the general principle of freely granting British patents as at present, the Committee feel that, owing to the extraordinary increase in method and process patents, the Patent Office examination should be made more strict when opposition has been entered or revocation proceedings have been commenced, so that mere "Paper Patents" or so-called "Blocking Patents" or "Repatenting Patents," the revocation of which involves considerable expense shall not be granted. In other words, where opposition is entered or revocation proceedings are commenced against an application, the Comptroller should be empowered to adopt any course he thinks fit to satisfy himself whether the grant should be allowed or not, even referring questions of fact to technical experts. As a step towards the reduction of expenses, the committee recommend that subject matter might be considered in opposition cases to the extent shown in some such amendment as the following to Sections 11 and 26 (as a new ground of opposition):—"That the specification does not describe or claim a new manufacture within the meaning of Section 6 of the Statute of Monopolies."

#### The Abuse of "User" Patents

The increase in the number of applications for "User" Patents is causing serious concern to British chemical manufacturers. In 1928 no fewer than 1,300 applications were filed by one firm alone, of which a large proportion was for "User" Patents. "User" Patents confer, of course, no direct manufacturing monopoly, but they form a very cogent sales argument and do, in many cases, actually bring about an effective manufacturing monopoly by hindering sales, since owners of patented processes will give a licence without royalty to anyone who will use their non-patented products when carrying out the patented process. It is suggested that the objection would be overcome by adding a paragraph to Section 27, Sub-section (2) of the Acts. The Section would then read:—(2) the monopoly rights under a Patent shall be deemed to have been abused in any of the following circumstances:—... (f) if a Patentee of a process covering the use of materials (whether or not they be the subject of a patent) permits the use of the invention under such conditions as to hinder or prejudice the existing manufacture of the said materials in the United Kingdom.

#### Medical Inventions

The subject of patents for inventions subserving medical treatment has received long and detailed consideration. The abandonment of medical patents by this country, without international agreement on the subject, would place both research workers and manufacturers at a serious disadvantage. The committee therefore urge their alternative proposal of Dedicated Patents.

#### Points of Difference

The committee are not in agreement with the proposal of the Guild Report to limit the age of anticipating documents to fifty years, as they feel that any patent ought to be invalidated by previous publication of the invention of whatever date.

The committee are opposed to the proposals of the Guild Report regarding the institution of Short Term Patents for inventions which are novel and useful, but are void of subject matter.

The memorandum deals with a number of other points, the recommendations being stated in clear and condensed terms.

## Future of the Colour Industry

### Mr. Percy Ashley on Recent Progress

MR. CYRIL EASTMAN, president of the Society of Dyers and Colourists, presided over the annual dinner of the society in London on Friday evening, March 28.

Proposing the toast of "The Society," Mr. Percy Ashley, Secretary of the Industries and Manufactures Department of the Board of Trade, said that their industry to-day possessed more vitality than ever before in its history. They seemed to have entered on one of those recurrent epochs in which there was an abundant demand for more and more colours. In some of its manifestations the desire for colour was, he thought, a sign of spiritual unrest, but it was mainly the expression of the revulsion against the growing uniformity and dullness of the external aspects of modern civilisation. It was not confined to ladies' dresses and to furniture, but was shown in the dress of men. There was even some hope that colour might extend to architecture.

### The Fastness Problem

All this made an increasing demand on the science and art represented by the society. Mr. Ashley congratulated the society and its London section on a very successful year, and on the co-operative efforts of the various interests represented. These had taken two forms. If the society had achieved nothing more than the Colour Index of 1924 and the supplementary index of 1928—a work it was still carrying on—it would amply have justified its existence. In its other most important work, the standardisations of methods of testing fastness of colour substantial progress had been made and there was every prospect of international co-operation being secured.

A third activity that would shortly become effective was the creation of a British Colour Council. "At present," said Mr. Ashley, "the colours of fashion are determined chiefly abroad. British fabric design leads the world, and we have by far the largest textile export trade in the world. It is worth while to make a strenuous effort to assert ourselves to take the lead and not always to follow. It is not an easy thing to do. It needs the whole-hearted co-operation of all concerned—the manufacturers of textiles and of colours, fashions designers, makers-up, and finishers. One thing is obviously essential—a strong dyemaking industry working in the closest co-operation with the users of colour. A great deal has already been done in building up such an industry. The output of dyestuffs in 1928 was five and a half times that of 1913. The figures for 1929 are not complete, but will probably show a 10 per cent. increase.

"There has," he continued, "undoubtedly been a great improvement during recent years in range and quality. British dyemakers can claim to some recent outstanding discoveries. There remains much ground to be covered, but what has been done holds out abundant promise. What is wanted is a closer working together of dyemakers and of dyers and colourists towards a common objective. If we can combine quality of textile design, quantity of dyestuffs and colouring matter, and quality of workmanship so as to give our customers throughout the world a guarantee of quality in the goods offered to them, we shall do a great deal to help the British textile industry out of its present state of depression."

### Chairman's Plea for Research

The Chairman, in responding to the toast, mentioned that London was the home of dyeing long before the industry made such great strides in Yorkshire, and the art of dyeing was not extinct in London at the present time. There were disturbing factors in industry at the moment. Conditions in the woollen industry gave rise to much anxiety, and he sincerely hoped that the present gloomy prospect in that industry would soon improve. Problems of research in the past year had been closely concerned with the work of the Fastness Tests Committee. That work had proved more intricate than was at first foreseen, but he believed that work would prove of very great advantage to the users of dyestuffs throughout the country. This research work was expensive and the financial position of the Fastness Tests Committee was a very critical one just now. It would be a calamity if this work had to be abandoned and he earnestly appealed for continued and increased financial assistance for the Committee.

The toast of "Allied Societies and Industries" was proposed by Mr. Reginald Brown, and replied to by Professor J. F. Thorpe, President of the Chemical Society. Dr. Herbert Levinstein proposed the toast of "The Guests," and this was replied to by Mr. Trevor Jocelyn Matthews, Prime Warden of the Worshipful Company of Dyers.

Mr. Matthews also made the presentation of the gold medal of the Worshipful Company of Dyers, which has been awarded to Dr. F. Schofield, of the Manchester College of Technology, an old pupil of Professor Green's at Leeds. The gold medal of the society was presented to Mr. A. Silverwood, of Bradford, who was honorary secretary of the Society from 1913 to 1929.

## New Trial in Lever Action

Rehearing on May 5

ON the application of Mr. P. Vos, and with the consent of all parties, Mr. Justice Wright, in the King's Bench Division, fixed May 5 for the retrial of the action by Lever Bros., Ltd., of Port Sunlight, against Mr. Ernest Hyslop Bell, of Granby Hotel, Harrogate, and Mr. Walter Edward Snelling, of St. Ronan's, Putney Heath, formerly chairman and vice-chairman respectively of the Niger Co., in which the plaintiffs owned practically the whole of the shares.

The action, an account of the opening of which appeared in our last issue, came before Mr. Justice Wright and a City of London special jury. After a hearing of several days, it concluded on Thursday, March 27, when his Lordship ordered a retrial in view of an application by counsel for plaintiffs to be allowed to amend their claim. He also gave leave to add the Niger Co. as plaintiffs.

## Dyestuffs Action: Extension of Period for Appeal

IN the Chancery Division on Wednesday, before Mr. Justice Maugham, the recent litigation between Imperial Chemical Industries and the I.G. Farbenindustrie was again mentioned.

His Lordship had made an Order for the revocation of the three German-owned patents for the manufacture of azo dye stuffs, suspending the Order for a certain period with a view to the German company lodging an appeal.

Mr. Trevor Watson, K.C., for the German company, now applied for an extension of the suspension of the Order until May 1. He said the German trust was a very large organisation with branches all over Germany, and it was very difficult to get into communication with all the parties concerned to see whether they wanted to appeal or not.

Mr. Lloyd Jacob, for the I.C.I., raised no objection, and his Lordship granted the application.

## Silver Wedding Presentations to Mr. and Mrs. Starke

PRESENTATIONS were made this week to Mr. E. E. Starke, publisher for many years of the *Hardware Trade Journal*, and a director since 1923 of Benn Brothers, Ltd., on the occasion of the twenty-fifth anniversary of his wedding. The board, in addition to presenting Mr. and Mrs. Starke with a grandmother clock suitably inscribed, adopted a congratulatory resolution which is to be engrossed and signed by Sir Ernest Benn (chairman), the directors and the senior members of the staff. The gifts from the staff of the *Hardware Trade Journal* were a silver cigar and cigarette box and silver and pearl dessert knives. Mr. Starke will be remembered by many readers of THE CHEMICAL AGE as manager of this journal for some time, following the death of Mr. Haslam.

## Gas Charges Fully Standardised

APRIL 1 saw the completion of the alteration in the basis of gas charges from the cubic foot to the therm, which began ten years ago on the passing of the Gas Regulation Act, 1920, and in an announcement dealing with the subject the British Commercial Gas Association states:—"Valuable as this alteration has been from the point of view of the public, much yet remains to be done to enable the public to secure the greatest benefit from what is admittedly by far the finest gas service in Europe. The National Fuel and Power Committee have already reported in favour of certain changes, and only pressure on Parliamentary time stands in the way of the modification of much of the archaic legislation governing gas supply in this country."

## A Bookman's Column

THE spring catalogue of scientific and technical books, just issued by Ernest Benn, Ltd., an interesting booklet of 84 pages, covers a very wide field, and includes works by recognised authorities in the main branches of science and technology. A number of new books in active preparation are announced. These include important works by Mr. S. G. M. Ure, a well-known authority on chemical engineering, on "The General Principles of Chemical Engineering," to be published at 35s.; by Messrs. C. A. Klein and W. G. Aston on "The Chemistry and Manufacture of Pigments and Paints," in two volumes, at a guinea each; by Mr. A. B. Searle on "Modern Brick-making," and "The Chemistry and Physics of Clays and other Ceramic Materials,"; by Dr. W. T. Dunn, secretary of the Institution of Gas Engineers, on "The History of the Gas Industry"; by Mr. H. Hollings, chief gas chemist to the Gas Light and Coke Co., and members of his staff, on "The Manufacture of Gas," in which the newest processes and types of plant are to be discussed in view of the latest experimental knowledge; by Major Claud G. Hyde and Mr. F. E. Mills on "Gas Calorimetry"; by Mr. Paul Oberhopper on "Industrial Iron and Steel"; by Professor Henry Louis on "The Mechanical Principles of Mining Appliances" and "Mineral Deposits"; by Sir Charles Parsons and Mr. Robert Dawson on "Motive Power and the Modern Steam Turbine," and many other distinguished writers. Students, who may find the prices of modern text books beyond their means, will note with interest that many useful works, such as those in the original Chemical Engineering Library, are now available at reduced prices. A copy of the catalogue will be sent free of cost to any reader of THE CHEMICAL AGE who applies to the Technical Sales Manager, Ernest Benn, Ltd., Bouverie House, London, E.C.4.

The *South American Handbook* for 1930 (Trade and Travel Publications, Ltd., pp. 743, 2s. 6d.), now in its seventh year of issue, is the only annual handbook to a continent which is changing and progressing rapidly. So rapidly do things move that over 2,000 changes have been noted since the last issue. The handbook claims, not without ground, to present South America in a nutshell. In it the business man will find almost everything he wants to know about the countries of Latin America, their products, railways, banks, currency, trade and present state of each particular industry in each particular country. The traveller for pleasure will find a reliable list of hotels at each town, and many interesting facts about the people and places. The Prince of Wales used the book during his South American tour.

A welcome addition to the Industrial Chemistry series is *Coal Carbonisation*, by R. Wiggington, lecturer in Fuel Technology at the University of Sheffield (Baillière, Tindall and Cox, pp. 288, 21s. net). After a survey of the history and development of carbonisation there is a long chapter devoted to "The action of heat on coal," embodying the fruit of much important research and showing a clear handling of a highly complicated subject. Other chapters deal with ammonia and its recovery, coal tar, and gas. Coal has, of course, been the subject of very intense research in recent years, and there is an abundance of valuable reference to French, German and American literature, as well as to that which has resulted from the investigations at Sheffield and elsewhere in England under Professor Wheeler.

An amazingly wide field is covered in *Everyday Chemistry*, by Professor T. R. Partington, of East London College (Macmillans, pp. 667, 7s. 6d.). Its purpose, states the author, is to provide a textbook for matriculation standard and a little beyond, but the range of subjects covered is very much wider than the syllabus of this examination. The author deals extensively with the historical and industrial sides of the science, and he has been very lavish with illustrations, those of chemical plant and its products being well selected, up to date and of a type likely to capture adolescent ambitions. A long list of questions culled from examination papers is provided at the end of each of the three parts into which the book is divided.



## "About Russia": By Sir Ernest Benn\*

### Illusory Trade Prospects

IT is opportune, at a time when a British Government attaches importance to the industrial capacity of the Soviet régime as a solvent for some of our unemployment, that a business man should publish his opinions on the subject. Sir Ernest Benn's new book will at once commend itself to those who heard gladly the "confessions of a capitalist," marking with satisfaction a break in the traditional and too self-effacing silence of the British business man.

The author has much to say about other aspects of the Russian problem than the purely economic. But to our readers the balance sheet of Anglo-Russian trade is the immediate and important thing, and upon this Sir Ernest makes many important points. He makes a close survey of the Five Year Plan of industrial reconstruction, to which the Soviet Government is now devoting much energy. As his information is provided by Communist documents, his criticism is the more effective. The following reason (provided by Sir Ernest's recent tour of the Baltic States) presents a pretty problem for the theorist who is apt to think of trade with Russia in terms of sentiment, not business:

"The liking of the Finnish workman for Bolshevism and its ways is not enhanced by the obvious fact that the Russian workers are keeping their fellows in Finland in a condition of very dire poverty. The Enso [timber] works have managed for some years to scrape out a 6 per cent. dividend on their capital, not an extravagant return from an industry which is conducted with great efficiency, but this figure is accompanied by wages to the women of about 15s., and to the men of about 30s. a week, respectively. These figures, it is true, mean more than they seem, because life at Enso is very simple, rents are not worth mentioning, fuel is free, supplies (such as they are) cheap. Nevertheless, women are working a twelve-hour day at strenuous tasks for 15s. a week, and even so, are threatened with unemployment because the Russians are supplying our and their markets at prices much lower than the Finns can accept. They have one object, and one object only, in delivering timber to London or to any other market. That object is to get cash, not to pay Russian wages, but to conduct Communist propaganda."

Again, on the argument that Russian trade depends on "credits," Sir Ernest is particularly trenchant:

"The Bolsheviks have, for years past, with and without recognition, sent to this country vast quantities of timber, oil, and other commodities, quantities which are well below the pre-war figures, but vast nevertheless. On the other side of the account, the Bolsheviks have made sundry purchases from us, very sundry and very few. In the year 1928 they shipped here £21,548,237 worth of materials, in respect of which that sum of money was placed to their credit in English banks. In the same year, they bought from us £2,715,987 of English-made goods, and £2,084,762 of foreign and colonial goods purchased through London. In respect, therefore, of these purchases, the sum of £4,800,749 was placed to their debit in their English bank accounts. There arose in this way, in this one year, a credit balance in favour of the Bolsheviks of nearly £17,000,000, available for any purpose they decide, but most easily available for the purchase of British goods and the provision of employment in this country. The money belongs to them and we cannot reasonably complain if they spend it on any form of propaganda which appeals to them. But when they ask us to lend more, then we are in duty bound to take these facts into consideration."

The foregoing quotations are typical of the writer's vigorous and penetrating point of view. Business men, looking at the problem in a practical way, will do well to study Sir Ernest's conclusions. In one respect the book is different from the author's other works. Sir Ernest has hitherto written of politics almost wholly in their relation to trade and industry. This time he offers his book as something else—a warning of what he believes to be the Bolshevik danger to the whole European tradition upon which, basically, our trade and industry and everything else repose.

\* *About Russia*. By Sir Ernest J. P. Benn, Bt. (Ernest Benn, Ltd. 6s.)

## Germany as a Market

To the Editor of THE CHEMICAL AGE.

SIR,—The *Europa's* successful effort to beat her country's own Atlantic record reminds us once more how surely Germany is re-establishing her status in Europe and the world.

The reminder is one to which a nation of shopkeepers may well pay heed to-day, when many of them talk in a fashion suggesting that the time has come to put the shutters up. In the year before the war we sold Germany £40,677,379 worth of goods. She was a good customer of ours then and the present possibilities of the German market may be measured by the fact that our exports to it last year were only two and a half million pounds short of the pre-war figure.

In these circumstances it is gratifying to learn that the German language again seems likely to beat Spanish as the second favourite (French, of course, leading) amongst us. Certain firms are now arranging for their representatives to learn German, and the German attitude is indicated by the collaboration of six eminent German professors with the Linguaphone Institute in producing a gramophone language course for students, while German salesmen are learning English by like means.

Trade with the Dominions overseas is a wholly admirable ideal; but we must not allow it to blind us to this vast market on our doorstep.—Yours, etc.,

J. E. MILLS,  
M.P. (Lab.), Dartford.

House of Commons.  
March 31.

## Institution of Chemical Engineers

THE April *Quarterly Bulletin* of the Institution of Chemical Engineers states that the following elections have recently been made:—

**Members.**—T. C. Finlayson, M.Sc., Woodall-Duckham Companies, London (Transfer); W. C. Mason, A.M.I.Mech.E., Non-Inflammable Film Co., Ltd., Croydon; W. S. Milne, B.Sc., A.I.C., London (Transfer); R. O. Newton, Coking and By-Product Works, Randolph Colliery, Evenwood; J. Davidson Pratt, O.B.E., M.A., B.Sc., F.I.C., Association of British Chemical Manufacturers and British Chemical Plant Manufacturers' Association, London; J. Sutherland, B. Laporte, Ltd., Luton.

**Associate Members.**—W. A. Barnett, Barnet District Gas and Water Co., Barnet; G. R. Elliott, M.Sc., A.I.C., Glycerine Refinery, Lever Bros., Ltd., Port Sunlight; G. A. Frampton, B.Sc., A.R.C.S., D.I.C., A.I.C., Super-Centrifugal Engineers, Ltd., London (Transfer); F. Hirsch, United Alkali Co., Ltd., Gateshead-on-Tyne; D. Hunter, Linium Products Syndicate, Ltd., Nottingham; Jaan Kopwille, Ph.D., Tartu University, Estonia; M. M. Melinsky, B.Sc., A.C.G.I., S. Hille and Co., London; H. Morten, B.Sc., A.R.C.S., D.I.C., Castner-Kellner Alkali Co., Weston Point, Ches. (Transfer); H. S. Pink, B.Sc., M.S., A.I.C., British Dyestuffs Corp., Ltd., Huddersfield (Transfer); Suresh Chandra Sen, B.Sc., B.A., University College, London; S. G. Watson, M.Sc., W. C. Holmes and Co., Ltd., London.

## £112 Damages for Dismissed Chemist

MR. WILFRED GEORGE HAIGH, described as a works chemist, of Birmingham, was awarded £112 damages in lieu of three months' salary, at Leeds Assizes on Wednesday, March 26, in an action for wrongful dismissal against Hailwood and Ackroyd, Ltd., of Morley. The plaintiff was employed by the defendants from August, 1926, to September, 1929, as a works chemist at a salary of £450 per annum. The defendants contended that he was employed by special arrangement on a weekly basis. The Judge, in summing up, held that the plaintiff's work was competent, efficient and careful, and that there was no ground for the defendants' suggestion that he was inefficient and careless.

## Exemptions from Key Industry Duty

THE Treasury have made an order under Section 10 (5) of the Finance Act, 1926, exempting acid adipinic and oxymethyl paraoxy phenyl benzylamine methyl sulphate from Key Industry duty from April 1 to December 31, 1930. The order will shortly be published by the Stationery Office.

## British Aluminium Co., Ltd.

### Increased Demand for Products

At the 20th ordinary general meeting of the British Aluminium Co., Ltd., held in London, on March 28, Lt.-Col. Stephen H. Pollen, the chairman, said that the demand for the metal during the year had been good, and the company's total deliveries were well in advance of their previous record. In face of the intensified competition now in the market for a number of their products, no pains had been spared to stimulate the demand. Scientific research, skill in production and manufacture of the metal, careful analytical methods, wide study of new applications, together with energetic and attentive salesmanship, had all combined to secure increased deliveries.

The most important event in the period under review was the completion of the first stage of the Lochaber Works. When completed, the undertaking would develop 120,000 h.p., and would be by far the largest hydro-electric installation in the British Isles. During last year the lining of the 15-mile tunnel was completed; the power house, aluminium factory and other works were advanced and completed, and the production of aluminium was commenced before the end of December. As to the current year, industrial conditions were somewhat obscure, but he did not see any sign of a decrease of demand for their metal at the present time, and the directors looked forward with confidence to being able to dispose of all the company's production, including that which they might expect from the new Lochaber Works.

The report and accounts were unanimously adopted, and a final dividend of 6 per cent. on the ordinary shares, making, with the interim dividend, 10 per cent. for the year, less tax, was declared.

### Illegal Use of Word "Chemists"

JUDGE HILL-KELLY, at the Bloomsbury County Court, on Friday, March 28, gave judgment with costs for the Pharmaceutical Society of Great Britain in an action against the Arcade (Brixton) Pharmacy, Ltd., of Brixton, to recover £5 for taking, using or exhibiting the name or title of a chemist at their premises, contrary to the Pharmacy Act, 1868. Further, it was contended, defendants had failed to comply with the Act, as they had never had a duly registered superintendent, a pharmaceutical chemist, or chemist and druggist.

Mr. Glyn Jones, for the plaintiffs, said the defendants had been before the court before in connection with the same sign, and judgment had been given against them for £5. The sign, which read "Chemists' articles obtainable at cut prices," was still outside the shop, but an apostrophe had been added after the "s" in "chemists." That word appeared on the sign in the largest letters. An officer of the Society said that the defendants had never registered a pharmaceutical chemist.

For the defence, Mr. H. J. Denton, the managing director of the company, said that in their business they did not keep, retain or dispense poisons. They sold goods that an ordinary pharmacist sold with the exception of poisons, and the sign with the word "chemists" on it was merely to emphasise the type of article they sold.

### Bede Metal and Chemical Co., Ltd.

SIR ALFRED PALMER, who presided at the annual meeting of the Bede Metal and Chemical Co., Ltd., at Hebburn, on March 26, said that the report showed another prosperous year, which enabled them further to increase their dividend and the balance carried forward; to add more largely to their reserves after adequately writing down their assets, and so establish yet more firmly the sound basis of their business on conservative lines.

The Hebburn works stood at a lower value in their books, although they were being continually improved and their capacity increased. The Killingdal mine in Norway, which was destroyed by fire, had been reconstructed on a new plan. Some shareholders might have expected a higher dividend than 1s. 9d. per share, but in view of past experience and the unsettled state of home industries, closely pressed by universal foreign competition, the directors thought it desirable not only to create, but to conserve their resources.

The report and the dividend were adopted, and Sir Alfred Palmer and Mr. Wilfred Hall were re-elected directors.

## Chemical Matters in Parliament

### Animals Killed in Porton Experiments

PURSUANT to his reply to Mr. Ayles (House of Commons, March 25), Mr. T. Shaw (Secretary of State for War) has issued the following statement showing the numbers of animals used for experimental purposes at the Chemical Warfare Experimental Station, Porton, since 1921, and the number of such animals who were killed as a result of the experiments:—Rabbits, 2,110 used (413 killed); rats, 436 (195); goats, 162 (62); guinea pigs, 1,250 (375); cats, 251 (83); monkeys, 31 (17); mice, 533 (258); horses, 17 (none); canaries, 40 (40); pigeons, 46 (38); fowls, 30 (30); sheep, 2 (none).

In reply to Mr. Freeman (House of Commons, Tuesday), Mr. Shaw stated that the only laboratory other than that at Porton, where experiments on living animals are conducted in connection with chemical warfare, is the Physiological Laboratory at Cambridge. The 404 animals used during the years 1927-30 had included cats, pigeons, rabbits and rats, and 290 had been killed.

### Coal for Gas Works

In the course of report stage of the Coal Mines Bill in the House of Commons on Tuesday, an amendment moved by Captain Hudson proposed that coal for carbonisation or gasification should not be sold at preferential rates as against coal supplied to gas undertakings.

Mr. Graham said under the Bill public utility undertakings would be called upon to pay an economic price for coal.

Lieut.-Colonel Ward said that gas companies did not wish to buy their coal at an uneconomic price; all they asked was to be allowed to buy on the same terms as were given to their competitors with coking plant or low-temperature carbonisation plant who produced coke, tar, and benzol. If gas companies had to pay more, they must charge an increased price to their consumers; and, under the sliding scale, every increase in the price of gas meant correspondingly reduced dividend.

The amendment was defeated by 268 to 202.

### Chemical Works Accident

A HYDRO-EXTRACTING machine revolving at a high rate of speed burst at the works of the Humber Chemicals, Ltd., in Vauxhall Grove, Hull, on Wednesday, and two men and two apprentices were injured by flying fragments.

James Meggitt, an apprentice, who was feeding the machine with buckets of common soda, received severe injuries to the legs and face, and was detained at the Royal Infirmary. William Jefferson, foreman, injuries to both legs, Robert Thompson, under foreman, cuts on the face and Harry Kirkpatrick, apprentice, cuts about the face and hands and also leg injuries.

The outer metal casing of the machine was shattered and the soda was flung with great force about the works, some of it falling on property on the opposite side of the street.

### E. A. Brough and Co., Ltd.

E. A. BROUGH AND CO., metal workers, etc., Liverpool, inform us that as from March 20 last, their business has been formed into a limited company, under the style of E. A. Brough and Co., Ltd., the object being to obtain certain advantages enjoyed under incorporation. Mr. Brough is the sole director, and all debts and liabilities will be received and discharged by the new company.

### "C.A." Queries

*We receive so many inquiries from readers as to technical, industrial, and other points, that we have decided to make a selection for publication. In cases where the answers are of general interest, they will be published; in others, the answers will simply be passed on to the inquirers. Readers are invited to supply information on the subjects of the queries:—*

141 (*Bacterial Cultures*).—A county analyst desires to be put in touch with producers of cultures for accelerating the ammoniacal fermentation of tankage, straw, bones, etc.

## From Week to Week

THE 1930 NOBEL PRIZES will each amount to £9,608, according to a report drawn up by the auditors of the Foundation.

WM. GARDNER AND SONS (GLOUCESTER), LTD., have opened a London office at 19, Grays Inn Chambers, 20, High Holborn; W.C.1.

OVER FIFTY PAPERS will be read at the third (triennial) Empire Mining and Metallurgical Congress now taking place in South Africa.

A PURCHASE OF 40,000 tons of Chilean nitrate, it was reported last week, has been arranged by Russia. The necessary credit is stated to have been arranged in the United States.

MR. J. MACMILLAN, owing to pressure of work, has retired from the honorary secretaryship of the Scottish Section of the British Association of Chemists, and Mr. R. W. Dunlop has been appointed to succeed him.

THE SULPHATE OF COPPER MARKET in Algeria is dealt with in a confidential report prepared by the Department of Overseas Trade from information furnished by the Consul-General at Algiers and issued to firms whose names are entered on its special register.

THE LECTURE ON "The Fabrication of Acid-Resisting Steel Plant," which was delivered by Dr. W. H. Hatfield in October before the Institution of Chemical Engineers, is to be repeated before the Manchester Section at the Municipal College of Technology on Friday next.

MR. H. N. LINSTED, secretary and registrar of the Pharmaceutical Society, in giving evidence before the Licensing Commission in London last week, made the interesting announcement that their attempts, in conjunction with the excise authorities, to make methylated spirit so unpalatable that nobody could drink it had not succeeded.

MR. W. E. CLIFFORD, consulting chemical engineer on wood distillation technology, has left the United States for Russia to take charge of the wood distillation activities for the U.S.S.R.'s chemical trust. His headquarters will be at Moscow. Mr. Clifford was once chief technologist for the Mysore Government in India, and in the United States he has worked with the Kentucky Colour and Chemical Company, Forest Products Chemical Company, and the Miner-Edgar Chemical Company.

CHANGES OF ADDRESS: Metropolitan-Vickers Electrical Co., Ltd., Trafford Park, Manchester, owing to their need of increased accommodation, have had to take new premises in Leeds. The new address of their Leeds office is Permanent House, The Headrow, Leeds. Telephone Nos., "Leeds 20444 and 20445"; telegraphic address, "Multiphase, Leeds." The Newcastle-upon-Tyne Zinc Oxide Co. announce that from February 1 last their main operations were transferred to their new works at Birtley, and that all correspondence, inquiries, etc., should now be addressed to Mitchell Street, Birtley, Co. Durham.

MR. COWAP, presiding over the annual meeting at Singapore of the Malaya Section, formed in 1923, of the Institute of Chemistry, said it was a matter for congratulation that the Director of Agriculture, Dr. H. A. Tempany, and the acting Director of the Rubber Research Institute, Major B. J. Eaton, were both chemists and Fellows of the Institute of Chemistry, and that the Government Analyst Department, Singapore, had recently been made an independent department with the creation of a new appointment of Chief Chemist. Regret was expressed at the death of Dr. Dent, the first chairman of the section. Dr. H. A. Tempany was elected chairman for the ensuing year.

UNIVERSITY NEWS.—*London*—The title of professor in the University has been conferred on the following teachers at the Imperial College of Science and Technology:—H. B. Baker, F.R.S. (Chemistry); W. A. Bone, F.R.S. (Chemical Technology); Sir Harold C. H. Carpenter, F.R.S. (Metallurgy); J. W. Hinchley (Chemical Engineering); J. C. Philip, F.R.S. (Physical Chemistry); and J. F. Thorpe, F.R.S. (Organic Chemistry). A D.Sc. in Chemistry has been conferred on Mr. R. F. Hunter, Imp. Coll., Royal College of Science, *Durham*.—An honorary degree of Doctor of Science is to be conferred on Professor Frederick George Donnan, F.R.S., Professor of Inorganic and Physical Chemistry at King's College, London.

THE DEGREE OF CHEMICAL ENGINEER is to be bestowed as the result of an arrangement between the Department of Chemistry at Cornell University, U.S.A., and the College of Engineering, who are to provide a joint curriculum covering a five years' course.

MR. R. W. GLASS and Mr. Frank Lee, M.P., have been appointed members of the Safety in Mines Research Board to fill the vacancies caused by the retirement from the Board, under the rotational scheme of retirement, of Sir John Cadman and Mr. A. M. Henshaw.

PROFESSOR W. J. JONES, of Cardiff University College, has been appointed chairman of the South Wales section of the Society of Chemical Industry in succession to Professor J. S. Coates. Mr. J. H. Wells has been elected vice-chairman and hon. treasurer, and Mr. George Fadel hon. secretary.

AMONGST RECENT ORDERS received by the Underfeed Stoker Co., Ltd., are complete ash sluicing plants for the London Power Co., Ipswich Corporation, Shropshire, Worcs. and Staffs. Electric Power Co., Ltd., Ed. Lloyd and Co., Ltd., Battersea Power Station, Severn Power Station, Stourport, Worcestershire; Kemsley Paper Mills, Sittingbourne.

A BOARD OF TRADE COMMITTEE has been appointed to consider present trade practices which result in withholding from particular retail traders supplies of goods in which they wish to deal or which prevent the resale of such supplies except upon conditions imposed by the suppliers, and to report whether all or any of such practices are detrimental to the public interest, and, if so, what alterations in the existing law are necessary.

THE PATENT COAL CARBONISING TRUST, LTD. (writes our South Wales correspondent) has completed arrangements for the purchase of the Neath Abbey Patent Fuel Works, Neath, and its adjoining chemical works. The Neath Abbey Works, which were established for the purpose of manufacturing a patent fuel, were closed down three years ago. Its new owners will instal plant for working a process for oil production from coal and low temperature carbonisation.

THE STANDARD OIL CO. of New Jersey, U.S.A., it is learned, is installing a hydrogenation process in three of their big refineries, the first to be ready in May. The process is being formally offered to refining companies that can commercially use it, and it is proposed to form a separate company to own the United States rights of this process for refining oils. All companies using it will subscribe the capital and pay a small royalty.

TO ENCOURAGE INVENTIVE TALENT among those whose circumstances do not permit them to undergo the ordinary courses of technical training, the Institute of Patentees has decided to found a series of presentation courses at one or more of the recognised technical schools and polytechnics. The scholarships are open to candidates of both sexes of all nations and, in general, of any age over 16. They entail about three evenings' work a week, besides homework. Successful candidates will have the necessary fees paid for them—including associate membership of the Institute of Patentees (Inc.)—and a grant of £1 towards the cost of books.

BRISTOL AND SOUTH-WEST COUNTIES' section of the Institute of Chemistry held its ninth annual meeting in Bristol University, Mr. Edward Russell presiding. The reports of the hon. secretary and treasurer for the past session showed a membership of 188, and a satisfactory balance. Officers elected for the ensuing year were:—Professor W. E. Garner, Mr. R. D. Littlefield, Mr. F. H. Barke, Mr. R. H. Ellis (Gloucester), Professor W. H. Lewis (Exeter), and Mr. F. Southerden (Exeter), on the committee; Dr. H. F. Dean and Mr. A. E. Jones, auditors; Mr. A. W. M. Wintle, hon. secretary and treasurer.

### Obituary

MR. RICHARD HILLIDGE, of Runcorn, for 27 years with the Castner Kellner Works, aged 81.

MR. FREDERICK CHARLES SMITH, for 56 years in the service of Johnson and Matthey, Hatton Garden, London, on March 26, aged 83.

HERBERT EDWARD DAVIES, F.I.C., analytical and consulting chemist and public analyst, at 42, Eshe Road North, Blundell-sands, Liverpool, on April 2.

SIR WILLIAM SYMINGTON MCCORMICK, F.R.S., chairman of the Advisory Council of the Department of Scientific and Industrial Research, on March 23, at sea.



## Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

### Abstracts of Accepted Specifications

324,492. OXIDATION OF ORGANIC COMPOUNDS OF HIGH MOLECULAR WEIGHT. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, December 31, 1928.

Organic compounds of high molecular weight, e.g., paraffin wax, are oxidised with higher oxides of nitrogen at increased pressure and in highly concentrated form. Thus, molten paraffin wax may be treated at 60° C. and 4 atmospheres pressure with liquid nitrogen tetroxide, yielding a product containing only 12 per cent. of unsaponifiable matter. The nitrogen tetroxide is converted into nitrogen monoxide, which is treated with oxygen to obtain the tetroxide for use again. Other examples are given of the oxidation of paraffin wax with nitrogen dioxide and oxygen, constituents of American fuel oil with nitrogen dioxide, and benzene with nitrogen dioxide. The latter product is rich in lower fatty acids.

324,538. ORGANIC ACIDS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, February 8, 1929.

Oxidation products of paraffin wax, montan wax or gas oil are saponified, and the aqueous soap solution is treated with a water-insoluble organic extracting agent such as ligroin, benzene or ethers. The extract is mixed with mineral acid and the emulsion separated is decomposed with an aliphatic alcohol such as methyl alcohol, and the layers formed are separated. Thus, oxidised paraffin wax, containing 20 per cent. unsaponifiable material, is saponified with caustic soda, and the soap solution diluted with water and shaken with benzene at 60° C. An emulsion is formed and clear soap solution is separated by centrifuging. The emulsion is shaken with methyl alcohol, and two layers are formed, the lower being clear soap solution and the upper containing the benzene, part of the methyl alcohol, and a solution of the unsaponified material. Mineral acid is added to the soap solution to separate the fatty acids.

324,541. CATALYTIC AGENTS. Compagnie Internationale pour la Fabrication des Essences et Pétroles, 1, Avenue de Villars, Paris. International Convention date, November 10, 1928.

A catalyst for use in cracking operations, etc., consists of activated aluminium silicate, and a plastic silicate such as clay in the proportion of less than 30 per cent. The mixture may contain a small quantity of alumina produced by adding aluminium sulphate, and then sodium hydroxide. The sulphates are removed by successive washings.

324,631. WAXES, ESTERS, AMIDES, ACID ANHYDRIDES, BITUMINOUS COMPOSITION. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, September 24, 1928.

Montan wax bleached by oxidation, and a fatty aromatic or hydroaromatic acid are esterified by means of a polyhydric alcohol in the presence of a catalyst such as sulphuric or hydrochloric acid. Hydrocarbons, oily, fatty or waxy resinous substances containing no free COOH groups may be added before, during or after esterification. The bleached wax may be replaced by a conversion product still containing free acid, and the polyhydric alcohol by carboxylic acids, aldehydes, ketones or phenols containing two or more hydroxyl or halogen groups capable of esterification. In an example, a mixture of coconut oil, fatty acids, ethylene glycol or polyglycol, and sulphuric acid is heated to 120°-130° C., and bleached montan wax, tallow acids and wool grease are then added, and the mixture again heated. Some other examples are also given. The products resemble natural wax and are suitable for use in boot or floor polishes.

324,650. DYEING PROCESSES. British Celanese, Ltd., 22, Hanover Square, London, G. H. Ellis, and W. B. Miller, British Celanese, Spondon, near Derby. Application date, September 29, 1928.

In processes involving the diazotisation of amino bases or amino colouring matters on the material with subsequent

development, pattern effects are obtained by treating locally before diazotisation with discharge or resist agents adapted to render the amines incapable of diazotisation, and then diazotising and developing the amine on the untreated parts. The discharge or resist agents may be oxidising agents or reducing agents—e.g., chlorates or chromates; or formaldehyde-sulphoxylates, sodium hydrosulphite or stannous chloride. The chlorates may be combined with accelerators or catalysts such as salts of iron or vanadium, and assistants such as tartaric acid, citric acid or sodium citrate. Amino bases and colouring matters employed include *m*- and *p*-nitraniline, *p*-nitro-*o*-toluidine, *m*- and *p*-nitro-*o*-anisidine, amino-azobenzene, amino-azotoluene, *p*-amino-azobenzene-azo-dimethylaniline, *p*-amino-azobenzene-azo- $\alpha$ -naphthyl amine, *o*-methoxy-benzene-azo- $\alpha$ -naphthylamine, *p*-dimethylamino-benzene-azo- $\alpha$ -naphthylamine, benzidine, tolidine, dianisidine, diamino-diphenyl-methane, Diazamine Bordeaux B and Chlorazol Black BH. The developers employed include xylinines, cresidines, anisidines, phenetidines, *m*-toluidine, *m*-phenylene-diamine, nitro-*m*-phenylene-diamine, alkyl-, aryl- and aralkyl-anilines, phenols, cresols, resorcinol, aminophenols, alkylaminophenols,  $\alpha$ - and  $\beta$ -naphthylamines and their alkyl derivatives, naphthylamine ethers,  $\omega$ -oxy-ethyl- $\alpha$ -naphthylamine,  $\gamma$ -chlor- $\beta$ -oxypropyl- $\alpha$ -naphthylamine, aminonaphthoic acids, aminonaphthols, and acetyl and other derivatives. Particulars are given of the production of coloured oxidation discharges and coloured reduction discharges, especially on cellulose esters and ethers. A number of examples are given of the dyeing of cellulose acetate materials.

324,661. NAPHTHALENE DERIVATIVES. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, September 26, 1928.

Benzoquinone or benzoquinones substituted in the 2- or 2- and 3- positions are condensed with 1:3-butadienes. In the case of benzoquinone, low temperatures and short duration of the reaction, or the use of less than two molecular proportions of butadiene, are employed to avoid the formation of anthracene derivatives. The condensation products undergo hydrogen displacement on heating with or without a diluent, or when treated with acid or alkaline agents. Hydrogenated 1:4-di-oxy-naphthalenes are obtained and may be converted into naphthoquinones by dehydration. Examples are given of the condensation of benzoquinone with 1:3-butadiene, isoprene, and 2:3-dimethyl-1:3-butadiene, toluquinone with 1:3-butadiene, monochlorbenzoquinone with 2:3-dimethyl-1:3-butadiene, 2:3-dichlor-benzoquinone with 1:3-butadiene and 2:3-dimethyl-1:3-butadiene. The condensation product from benzoquinone and 1:3-butadiene is dissolved in alcohol and water and heated with hydrochloric acid to obtain 5:8-dihydro-1:4-dioxynaphthalene, which may be oxidised with ferric chloride in glacial acetic acid to obtain 5:8-dihydro-1:4-naphthoquinone, or an intermediate product of quin-hydronic nature. Alternatively, the oxidation may be effected with potassium bichromate to obtain 1:4-naphthoquinone. The condensation product from benzoquinone and 2:3-dimethyl-1:3-butadiene is heated with hydrochloric acid to obtain 5:8-dihydro-6:7-dimethyl-1:4-dioxy-naphthalene which may be oxidised with potassium bichromate to obtain 5:8-dihydro-6:7-dimethyl-1:4-naphthoquinone and 6:7-dimethyl-1:4-naphthoquinone. By similar treatment, the condensation product from toluquinone and 1:3-butadiene is converted into 2-methyl-5:8-dihydro-1:4-dioxy-naphthalenes and then into 2-methyl-1:4-naphthoquinone. If isoprene is employed instead of butadiene, the corresponding 6-methyl-compounds are obtained. The condensation product from 2:3-dichlor-benzoquinone and 2:3-dimethyl 1:3-butadiene may be oxidised to obtain 6:7-dimethyl-2:3-dichlor-1:4-naphthoquinone.

324,663. MAKING EMULSIONS AND TREATING LATEX. H. D. Elkington, London. From Naamlouze Vennootschap de Bataafsche Petroleum Maatschappij, 30, van Bylandtlaan, The Hague. Application date, October 24, 1928.

Aqueous dispersions of oils, tar, asphalt, paraffin wax or

rubber, or natural dispersions such as rubber latex are treated with a protective colloid, and then with an agent which reverses the charge on the dispersed particles *e.g.*, acids, solutions of multivalent salts, basic dyestuffs such as methylene blue, hydrosols with positively charged particles such as freshly precipitated aluminium hydroxide. Asphalt dispersions which contain negatively charged particles may be treated with 20 per cent. gelatine solution, then with N/10 hydrochloric acid and freshly precipitated aluminium hydroxide. The products are stable in the presence of solutions of calcium chloride, ferric chloride, etc. The positive charge on the particles of precipitated aluminium hydroxide is reversible to negative by adding an asphalt dispersion after treatment with a protective colloid.

324,683. DYEING PROCESSES. British Celanese, Ltd., 22, Hanover Square, London; G. H. Ellis and W. B. Miller, of British Celanese, Spondon, near Derby. Application date, August 24, 1928.

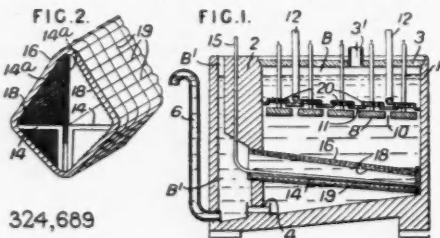
The process is for obtaining pattern effects on textile materials, particularly those formed of cellulose esters or ethers, but is applicable to materials containing cotton or regenerated cellulose fibres. The material is treated by applying locally an agent adapted to inhibit oxidation, then applying an oxidising agent, and then an aromatic compound such as *p*-amino-diphenylamine,  $\alpha$ -naphthylamine, benzidine or aniline, or mixtures capable of yielding by oxidation a colour which is not dischargeable by ordinary reduction discharges, and then developing the colour by oxidation. Agents for inhibiting oxidation include hydrosulphites, oxalates, and sodium formaldehyde-sulphoxylate, and oxidising agents include chlorates and bichromates, with or without catalysts such as salts of iron, copper, or vanadium. Several examples are given.

324,685. TREATING TIN ORES. S. Tamaru, 254, Ogigayatsu, Kamakura Machi, Kamakura Gun, Kanagawa Ken, and Y. Koizumi, 1328, Oaza Minami Shinagawa Juku, Shinagawa Machi, Ebara Gun, Tokio Fu. Application date, September 3, 1928.

Cassiterite or tin-bearing tungsten ores are heated to 850° C. with a base of an alkaline earth metal or magnesium, in the presence of a small amount of a reducing agent such as coal, charcoal, oil, tin, zinc, hydrogen or carbon monoxide. The product is leached with sulphuric acid or an alkali to obtain tin compounds free from iron and silica. The extraction is facilitated by the addition of a salt such as sodium chloride.

324,689. ELECTROLYSIS OF ALKALI CHLORIDES. P. Pestalozza, 17, Via Guerrazzi, Milan, Italy. Application date, October 1, 1928.

The object is to avoid harmful disturbances of the electrolyte. The main chamber B and secondary chamber B' of



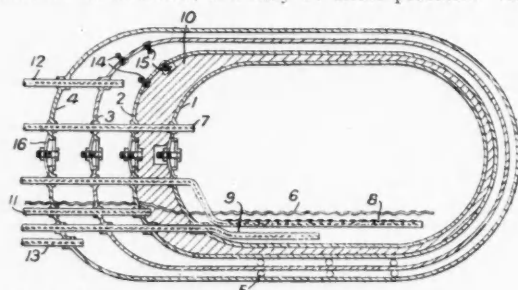
324,689

the cell 1 are connected at the bottom by a small orifice 4 in the dividing wall 2. The anodes 8 consist of carbon plates separated by passages 10, and the cathode units are mounted below the anodes and transversely to them so that they slope in a direction opposite to that of the tank bottom. Each cathode consists of a shell 16 of asbestos fibre with an inner lining 18 of iron wire netting, supported by angular members 14 and a central rib 14a. The shell 16 is surrounded by asbestos yarn. Diaphragms 11 supporting perforated plates 20 of porcelain or earthenware are arranged above the spaces 10 to prevent turbulent movement of the electrolyte due to liberated chlorine. The electrolyte is continuously supplied through pipes 12 and the denser cathode liquor is discharged from the chamber B' through a pipe 6.

324,692. DESTRUCTIVE HYDROGENATION. M. McGuinness, 20, Copthall Avenue, London. Application date, October 2, 1928.

Carbonaceous materials are destructively hydrogenated in a reaction vessel 1 surrounded by a vessel 2 containing

insulating material such as asbestos which is maintained under pressure by means of a gas. Alternatively, oil may be used as an insulator, and may be under pressure. Addi-



324,692

tional vessels 3, 4 are provided, under progressively decreasing pressures. Oil is introduced through a pipe 7, and hydrogen through a pipe 8, while the products are withdrawn by pipe 9. The pressure-gas pipes 11, 12, 13, heating element 6, and pipes 7, 8, 9 are all at one end of the apparatus, so that the vessels are free to expand on rollers 5.

324,774. CHLORINATED NAPHTHALENE COMPOUNDS. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. Application date, December 21, 1928.

Melted naphthalene is treated with chlorine at a temperature below 130° C. in the presence of a catalyst such as antimony, phosphorus, sulphur, iodine, or their compounds. Air is then passed through the melt and it may then be used directly or distilled at reduced pressure. The products are wax-like compounds.

324,844. SULPHURIC ACID. T. Riley and Sons, Ltd., Chemical and Copper Works, Hapton, Lancs, W. Wilde, Brooklyn, Hapton, Lancs, W. M. Coates, 1, Milton Street, Padiham, Lancs, and W. H. Bentley, 26, Uppingham Road, Wallasey, Cheshire. Application date, March 7, 1929.

Sulphuric acid is treated with hydrogen sulphide or with substances reacting with the acid to produce hydrogen sulphide, to remove arsenic, lead, selenium, etc., and flotation of the arsenic sulphide is produced by adding chlorinated aromatic or aliphatic hydrocarbons such as tetrachlorethane, trichlorethylene, or the oily dichlorobenzene obtained during the manufacture of paradichlorobenzene. A small quantity of nitric acid is added to remove colloidal sulphur.

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention:—301,329 (Durand and Huguénin Akt.-Ges.), relating to manufacture of dyestuffs, see Vol. XX, p. 105; 301,423 (I.G. Farbenindustrie Akt.-Ges.), relating to manufacture of monoazo dyestuffs, see Vol. XX, p. 105; 302,601 (I.G. Farbenindustrie Akt.-Ges.), relating to azo dyestuffs insoluble in water, see Vol. XX, p. 189; 305,648 (J. R. Geigy Soc. Anon.), relating to *o*-oxynitroso dyes and their heavy metal compounds, see Vol. XX, p. 384; 310,956 (Selden Co.), relating to carrying out catalytic reactions, see Vol. XXI, p. 10; 311,372 (I.G. Farbenindustrie Akt.-Ges.), relating to agents for use in vulcanizing rubber, see Vol. XXI, p. 34; 312,630 (B. F. Goodrich Co.), relating to preservation of rubber and the like, see Vol. XXI, p. 114; 313,446 (Montecatini Soc. Generale per l'Industria Mineraria ed Agricola), relating to ammoniac salts, see Vol. XXI, p. 156.

#### Specifications Accepted with Date of Application

- 300,130. Compounds having hydrogenated ring systems, Manufacture of. I.G. Farbenindustrie Akt.-Ges. November 5, 1927.
- 302,173. Azo-dyestuffs, Manufacture of. I.G. Farbenindustrie Akt.-Ges. December 10, 1927.
- 302,174. Concentrating aqueous acetic acid. I.G. Farbenindustrie Akt.-Ges. December 8, 1927.
- 302,733. Synthetic rubber, Manufacture of. I.G. Farbenindustrie Akt.-Ges. December 21, 1927.
- 303,006. Cellulose esters, Manufacture of. I.G. Farbenindustrie Akt.-Ges. December 24, 1927.
- 303,891. Transforming pig-iron into desulphurized and dephosphorized steel, or into pure iron, Apparatus for. Carbonization Soc. Generale d'Exploitation des Carbones. January 12, 1928.

- 304,654. Catalysts. Compagnie Internationale pour la Fabrication des Essences et Pétroles. January 23, 1928.
- 304,697. Dried superphosphate, Production of. Chemische Industrie Akt.-Ges. and H. Mayer. January 24, 1928.
- 304,731. Organo metallic compounds, Manufacture of. A. Carpmael. (*Schering Kahlbaum Akt.-Ges.*) January 24, 1929.
- 305,140. Aryl-carboxy-amido-ortho-thioglycolic acids, Manufacture of. I.G. Farbenindustrie Akt.-Ges. January 31, 1928.
- 306,949. Metals from their oxide ores, Production of. Trent Process Corporation. February 28, 1928.
- 308,717. Material containing a high percentage of calcium nitrate and capable of being readily strewn, Production of. F. Uhde. March 27, 1928.
- 316,126. Higher hydrocarbons, Production of. F. Fischer and H. Pichler. July 23, 1928.
- 326,467. Compounds of the general formula  $\text{RHC} \begin{array}{c} \diagup \text{C} \diagdown \\ \diagdown \text{C} \diagup \end{array} \text{Ar}$  especially derivatives of 1:3-diketohydrindene, Manufacture of. T. K. Walker, L. M. Walker, H. Shaw, and R. Black. November 12, 1928.
- 326,487. Organic intermediate compounds and dyestuffs. Baron Marks. (*E.I. Du Pont de Nemours and Co.*) December 8, 1928.
- 326,500. Condensation products of poly-nuclear hydrocarbon compounds and olefines, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) December 11, 1928.
- 326,515. Organic esters of cellulose and coating compositions containing the same, Manufacture of. British Celanese, Ltd. November 5, 1927.
- 326,523. Reduction products of indoxyl naphthindoxyl, their homologues and acyl derivatives, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) November 6, 1928.
- 326,525. Condensation products from aldehydes and amines, and the application thereof in the manufacture of vulcanised rubber, Manufacture of. Clayton Aniline Co., Ltd., and H. Fritzsche. November 12, 1928.
- 326,529. Mixed fertilisers, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) November 16, 1928.
- 326,533. Soluble organic antimony compounds, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) December 12, 1928.
- 326,537. Organic arsenic antimony compounds, Manufacture of derivatives of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) December 13, 1928.
- 326,540. Distillation of coal, shale, peat, wood, and other fragmentary solid materials. S. Moore. December 15, 1928.
- 326,553. Alkylamine derivatives of organic compounds, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) December 17, 1928.
- 326,580. Catalysts of high mechanical stability, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) December 24, 1928.
- 326,586. Destructive hydrogenation, Apparatus for. W. R. Tate, H. P. Stephenson, and Imperial Chemical Industries, Ltd. December 31, 1928.
- 326,612. Gypsum, Method of reducing. Baron Marks. (*G. Polysius Akt.-Ges.*) January 23, 1929.
- 326,642. Ammonium chloride crystals, Manufacture of. Imperial Chemical Industries, Ltd., and C. W. Bunn. February 23, 1929.
- Applications for Patents**  
[In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.]
- Bangham, P. F., Imperial Chemical Industries, Ltd., Loveluck, R. J., Shaw, C., and Thomas, J. Production of phthalic acid derivatives. 9,958. March 28.
- Brandt, R. Method of obtaining potassium, etc., in purification of coal gas. 9,292. March 24.
- Brégeat, J. H. Treating residues of distillation of petroleum and tars, etc. 9,906. March 28. (France, March 29, 1929.)
- British Cyanides Co., Ltd., and Rossiter, E. C. Manufacture of synthetic resins and moulding powders. 9,552, 9,553. March 25.
- Bruce, R. N. B. D., Gas Light and Coke Co., Ltd., and Griffith, R. H. Destructive hydrogenation of hydrocarbons. 10,066. March 29.
- Bunbury, H. M., and Imperial Chemical Industries, Ltd. Cores for castings. 10,098. March 29.
- Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of hormones. 9,425. March 24.
- Immunising seed grain. 9,556. March 25.
- Working up alkyl carbohydrates. 9,557. March 25.
- Manufacture of artificial masses. 9,558. March 25.
- Carter, P. G., Imperial Chemical Industries, Ltd., and Thomas, J. Production of dyes, etc. 10,039. March 29.
- Chance and Hunt, Ltd., and Fison, Packard and Prentice, Ltd. Sulphuric-acid chambers. 10,019. March 28.
- Chemische Fabrik vorm. Sandoz. Manufacture of substantive dyestuffs of stilbene series. 9,817. March 27. (Germany, March 30, 1929.)
- Deutsche Celluloid-Fabrik. Manufacture of cellulose ether nitrates 9,510. March 25. (Germany, March 25, 1929.)
- Manufacture of mixed esters of cellulose. 9,511. March 25. (Germany, March 25, 1929.)
- Du Pont de Nemours and Co., E. I., and Imperial Chemical Industries, Ltd. Manufacture of azo dyes. 9,340. March 24.
- Eastman Kodak Co., and Kodak, Ltd. Esterifying cellulose materials. 9,985. March 28.
- Recovery of cellulose acetate from acetic acid solutions thereof. 9,986. March 28.
- Cellulose acetate compositions. 10,076. March 29.
- Fairweather, D. A. W. Production of esters or hydroquinone derivatives. 9,546. March 25.
- Gas Light and Coke Co., Ltd., and Griffith, R. H. Manufacture of anthracene, etc., derivatives from crude coal tar fractions. 10,067. March 29.
- Conversion of hydrocarbons. 10,068. March 29.
- Goldschmidt Akt.-Ges., T. Process for producing calcium benzoate. 9,843. March 27. (Germany, April 3, 1929.)
- Gruselle, E. B. Evaporating, etc., liquids in vacuo. 9,319. March 24.
- Hamer, F. M., and Ilford, Ltd. Manufacture of dyes. 9,931. March 28.
- Henderson, S. T., Norris, W. S. G. P., Howes, D. A., and Imperial Chemical Industries, Ltd. Treatment of benzol. 9,647. March 26.
- Hooley, L. J., Imperial Chemical Industries, Ltd., Tatum, W. W., Thomas, J., Fraser-Thompson, R., and Todd, W. M. Dyes and dyeing. 9,956. March 28.
- Thomson, R. F. Production of dyes, etc. 10,039. March 29.
- I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Manufacture of ammonium carbonate. 9,357. March 24.
- Manufacture of artificial masses. 9,358. March 24.
- Manufacture of acrylic esters from  $\beta$ -chloropropionic acid esters. 9,359. March 24.
- Manufacture of complex aluminium compounds. 9,360. March 24.
- Manufacture of solid water soluble aluminium salts of oxalic acid. 9,361. March 24.
- Manufacture of aluminium salts of oxalic acids. 9,362. March 24.
- Manufacture of hydrosulphites. 9,363. March 24.
- Manufacture of azo dyestuffs. 9,364. March 24.
- Manufacture of glass having high refractive power. 9,676. March 26.
- Dyeing or printing vegetable fibres with mordant dyestuffs. 9,677. March 26.
- Manufacture of pure anhydrous aluminium chloride. 9,678. March 26.
- Recovery of refined products from coal, tars, etc. 9,806. March 27. (November 12, 1928.)
- Manufacture of vat dyestuffs. 9,953. March 28.
- Manufacture of benzoic acid. 10,064. March 29. (February 18, 1929.)
- I.G. Farbenindustrie Akt.-Ges. Manufacture of vat dyestuffs of the benzanthrone series. 9,424. March 24. (February 9, 1929.)
- Production of solutions for spinning. 9,809. March 27. (Germany, March 27, 1929.)
- Imperial Chemical Industries, Ltd. Process for treatment of gases containing hydrocarbons. 10,037. March 29.
- Intertrust Compagnie Générale de Distillation et Cokefaction à Basse Température et Minière Soc. Anon. Low-temperature carbonisation, etc. 9,860. March 27. (Belgium, April 6, 1929.)
- Lemmon, R. J. Production and employment of alkali thiocyanogen compounds, etc. 9,353. March 24.
- Liveria, V. A. de. Catalytic process for extracting chromium compounds from ores. 9,827. March 27.
- Maudsley, R. T. Sulphuric-acid chambers. 10,019. March 28.
- Mentzel, A. Superficial treatment of granular materials. 9,697. March 26. (Germany, March 26, 1929.)
- Manufacture of sodium hydroxide and ammonia. 9,698. March 26. (Germany, March 26, 1929.)
- Neumann, W. Method of producing aluminium, etc., alloys. 9,418. March 24.
- Panebianco, G. Catalytic process for extracting chromium compounds from ores. 9,827. March 27.
- Scottish Dyes, Ltd., and Thomas, J. Production of esters or hydroquinone derivatives. 9,546. March 25.
- Westvaco Chlorine Products, Inc. Electrolytic manufacture of chlorine. 9,412. March 24. (United States, January 27.)



## Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

### General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.  
 ACID, CHROMIC.—Is. 0½d. per lb. d/d U.K.  
 ACID HYDROCHLORIC.—Spot, 3s. 9d. to 6s. per carboy d/d, according to purity, strength and locality.  
 ACID NITRIC, 80° Tw.—Spot £20 to £25 per ton, makers' works according to district and quality.  
 ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.  
 AMMONIA (ANHYDROUS).—Spot, 10d. per lb., d/d in cylinders.  
 AMMONIUM BICHROMATE.—8½d. per lb. d/d U.K.  
 BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.  
 BLEACHING POWDER, 35%.—Spot, £7 10s. per ton d/d station in casks, special terms for contracts.  
 BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags carriage paid any station in Great Britain. Prices quoted are for one ton lots and upwards.)  
 CALCIUM CHLORIDE (SOLID).—Spot, £4 15s. to £5 5s. per ton d/d in drums.  
 CHROMIUM OXIDE.—9½d. and 10½d. per lb. according to quantity d/d U.K.  
 CHROMETAN.—Crystals, 3½d. per lb. Liquor, £18 15s. per ton d/d U.K.  
 COPPER SULPHATE.—£25 to £25 10s. per ton.  
 METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 3d. to 1s. 8d. per gall. pyridinised industrial, 1s. 5d. to 1s. 10d. per gall.; mineralised 2s. 4d. to 2s. 8d. per gall.; 64 O.P., 1d. extra in all cases.  
 NICKEL SULPHATE.—£38 per ton d/d.  
 NICKEL AMMONIA SULPHATE.—£38 per ton d/d.  
 POTASH CAUSTIC.—£30 to £33 per ton.  
 POTASSIUM BICHROMATE CRYSTALS AND GRANULAR.—4½d. per lb. nett d/d U.K. spot; ground ½d. per lb. extra.  
 POTASSIUM CHLORATE.—3½d. per lb., ex-wharf, London, in cwt. kegs.  
 POTASSIUM CHROMATE.—8½d. per lb. d/d U.K.  
 SALAMMONIAC.—Firsts lump, spot, £42 10s. per ton d/d station in barrels. Chloride of ammonia, £37 to £45 per ton, carr. paid.  
 SALT CAKE, UNGROUND.—Spot, £3 7s. 6d. per ton d/d station in bulk.  
 SODA ASH, 58° E.—Spot, £6 per ton, f.o.r. in bags, special terms for contracts.  
 SODA CAUSTIC, SOLID, 76/77%.—Spot, £14 10s. per ton, d/d station.  
 SODA CRYSTALS.—Spot, £5 to £5 5s. per ton, d/d station or ex depot in 2 cwt. bags.  
 SODIUM ACETATE 97/98%.—£21 per ton.  
 SODIUM BICARBONATE, REFINED.—Spot, £10 10s. per ton d/d station in bags.  
 SODIUM BICHROMATE CRYSTALS.—3½d. per lb. nett d/d U.K. spot. Anhydrous ½d. per lb. extra.  
 SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.  
 SODIUM CHLORATE.—2½d. per lb.  
 SODIUM CHROMATE.—3½d. per lb. d/d U.K.  
 SODIUM NITRITE.—Spot, £19 per ton, d/d station in drums.  
 SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.  
 SODIUM SILICATE, 140° Tw.—Spot, £8 5s. per ton, d/d station returnable drums.  
 SODIUM SULPHATE (GLAUBER SALTS).—Spot, £4 2s. 6d. per ton, d/d address in Glauber.  
 SODIUM SULPHIDE CONC. SOLID.—Spot, £10 5s. per ton d/d in drums. Crystals—Spot, £7 10s. per ton d/d in sellers' casks.  
 SODIUM SULPHITE, PEA CRYSTALS.—Spot, £13 10s. per ton, d/d station in kegs. Commercial—Spot, £9 per ton, d/d station.

### Coal Tar Products

ACID CARBOLIC CRYSTALS.—7d. to 7½d. per lb. Crude 60's, 2s. 4½d. to 2s. 5d. Jan.-June, 2s. 4d. July-Dec. per gall.  
 ACID CRESYLIC 99/100.—2s. 2d. to 2s. 6d. per gall. Pure, 5s. 6d. per gall. 97/99.—2s. 1d. to 2s. 2d. per gall. Pale, 95%, 1s. 9d. to 1s. 10d. per gall. 98%, 2s. 3d. Dark, 1s. 6d. to 1s. 10d. Refined, 2s. 7d. to 2s. 10d. per gall.  
 ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £4 10s. per ton.  
 ANTHRACENE OIL, STRAINED, 1080/1090.—4½d. to 5½d. per gall. 1100, 5½d. to 6d. per gall.; 1110, 6d. to 6½d. per gall. Unstrained (Prices only nominal).  
 BENZOLE.—Prices at works: Crude, 10d. to 11d. per gall.; Standard Motor, 1s. 5d. to 1s. 6d. per gall.; 90%, 1s. 7d. to 1s. 8d. per gall.; Pure, 1s. 10d. to 1s. 11d. per gall.  
 TOLUOLE.—90%, 1s. 9d. to 2s. 1d. per gall. Firm. Pure, 1s. 11d. to 2s. 5d. per gall.  
 XYLOL.—1s. 5d. to 1s. 10d. per gall. Pure, 1s. 8d. to 2s. 1d. per gall.  
 CREOSOTE.—Cresylic, 20/24%, 6½d. to 7d. per gall.; Heavy, for Export, 6½d. to 6½d. per gall. Home, 4d. per gall. d/d. Middle oil, 4½d. to 5d. per gall. Standard specification, 3d. to 4d. per gall. Light gravity, 1½d. to 1½d. per gall. ex works. Salty, 7½d. per gall.

NAPHTHA.—Crude, 8½d. to 8½d. per gall. Solvent, 90/160, 1s. 3d. to 1s. 3½d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 6d. per gall. Solvent 90/190, 1s. to 1s. 2½d. per gall.  
 NAPHTHALENE, CRUDE.—Drained Creosote Salts, £4 10s. to £5 per ton. Whizzed, £4 10s. per ton. Hot pressed, £8 per ton.  
 NAPHTHALENE.—Crystals, £12 5s. per ton. Purified Crystals, £14 10s. per ton. Flaked, £14 to £15 per ton, according to districts.  
 PITCH.—Medium soft, 40s. to 47s. 6d. per ton, f.o.b., according to district. Nominal.  
 PYRIDINE.—90/140, 3s. 9d. to 4s. per gall. 90/160, 3s. 6d. to 3s. 9d. per gall. 90/180, 1s. 9d. to 2s. 3d. per gall. Heavy prices only nominal.

### Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:  
 ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.  
 ACID ANTHRANILIC.—6s. per lb. 100%.  
 ACID BENZOIC.—1s. 8½d. per lb.  
 ACID GAMMA.—3s. 9d. per lb. 100% d/d buyer's works.  
 ACID H.—2s. 3d. per lb. 100% d/d buyer's works.  
 ACID NAPHTHIONIC.—1s. 6d. per lb. 100% d/d buyer's works.  
 ACID NEVILLE AND WINTHER.—2s. 7d. per lb. 100% d/d buyer's works.  
 ACID SULPHANILIC.—8½d. per lb. 100% d/d buyer's works.  
 ANILINE OIL.—8½d. per lb., drums extra, d/d buyer's works.  
 ANILINE SALTS.—8½d. per lb. d/d buyer's works.  
 BENZALDEHYDE.—1s. 8d. per lb., packages extra, d/d buyer's works.  
 BENZIDINE BASE.—2s. 4d. per lb. 100% d/d buyer's works.  
 BENZOIC ACID.—1s. 8½d. per lb. d/d buyer's works.  
 o-CRESOL 29/31° C.—£3 1s. 10d. per cwt., in 1 ton lots.  
 m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots d/d.  
 p-CRESOL 32/34° C.—2s. per lb., in ton lots d/d.  
 DICHLORANILINE.—1s. 10d. per lb.  
 DIMETHYLANILINE.—1s. 9½d. per lb., drums extra d/d buyer's works.  
 DINITROBENZENE.—8d. per lb.  
 DINITROCHLOROBENZENE.—£74 per ton d/d.  
 DINITROTOLUENE.—48/50° C., 7½d. per lb.; 66/68° C., 9d. per lb.  
 DIPHENYLAMINE.—1s. 8d. per lb. d/d buyer's works.  
 a-NAPHTHOL.—1s. 11d. per lb. d/d buyer's works.  
 B-NAPHTHOL.—£65 per ton in 1 ton lots, d/d buyer's works.  
 a-NAPHTHYLAMINE.—1s. per lb. d/d buyer's works.  
 B-NAPHTHYLAMINE.—2s. 9d. per lb. d/d buyer's works.  
 o-NITRANILINE.—5s. 11d. per lb.  
 m-NITRANILINE.—2s. 6d. per lb. d/d buyer's works.  
 p-NITRANILINE.—1s. 8d. per lb. d/d buyer's works.  
 NITROBENZENE.—6½d. per lb., 5-cwt. lots, drums extra, d/d buyer's works.  
 NITRONAPHTHALENE.—9d. per lb.  
 R. SALT.—2s. per lb. 100% d/d buyer's works.  
 SODIUM NAPHTHIONATE.—1s. 6½d. per lb. 100% d/d buyer's works.  
 o-TOLUIDINE.—8d. per lb., drums extra, d/d buyer's works.  
 p-TOLUIDINE.—1s. 9d. per lb. d/d buyer's works.  
 m-XYLIDINE ACETATE.—3s. 1d. per lb. 100%.  
 N. W. ACID.—4s. 9d. per lb. 100%.

### Wood Distillation Products

ACETATE OF LIME.—Brown, £9 15s. to £10 5s. per ton. Grey, £16 10s. to £17 10s. per ton. Liquor, 9d. per gall.  
 ACETONE.—£78 per ton.  
 CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.  
 IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.  
 WOOD CREOSOTE.—1s. 9d. per gall., unrefined.  
 WOOD NAPHTHA, MISCIBLE.—3s. 8d. to 3s. 11d. per gall. Solvent, 4s. to 4s. 3d. per gall.  
 WOOD TAR.—£3 10s. to £4 10s. per ton  
 BROWN SUGAR OF LEAD.—£38 per ton.

### Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 3d. per lb. according to quality; Crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.  
 ARSENIC SULPHIDE, YELLOW.—1s. 8d. to 1s. 10d. per lb.  
 BARYTES.—£5 10s. to £7 per ton, according to quality.  
 CADMIUM SULPHIDE.—5s. to 6s. per lb.  
 CARBON BISULPHIDE.—£25 to £27 10s. per ton, according to quantity.  
 CARBON BLACK.—4½d. to 4½d. per lb., ex wharf.  
 CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity, drums extra.  
 CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.  
 DIPHENYLGUANIDINE.—3s. 6d. per lb.  
 LITHOPONE, 30%.—£20 to £22 per ton.  
 SULPHUR.—£9 10s. to £13 per ton, according to quality.  
 SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.  
 SULPHUR PRECIP. B.P.—£55 to £60 per ton.  
 ZINC SULPHIDE.—8d. to 11d. per lb.

**Pharmaceutical and Photographic Chemicals**

ACID, ACETIC, PURE, 80%.—£37 per ton, ex wharf London, barrels free.

ACID, ACETYL SALICYLIC.—2s. 9d. to 2s. 11d. per lb., according to quantity.

ACID, BENZOIC B.P.—2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. 3d. to 1s. 4d. per oz.; 50-oz. lots, 1s. 3d. per oz.

ACID, BORIC B.P.—Crystal, £32 per ton; powder, £36 per ton; For one ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.

ACID, CAMPHORIC.—19s. to 21s. per lb.

ACID, CITRIC.—1s. 8½d. to 1s. 9d. per lb., less 5%.

ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.

ACID, MOLYBDIC.—5s. 3d. per lb. in ½ cwt. lots. Packages extra. Special prices for quantities and contracts.

ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.

ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 7d. per lb. Technical.—1s. to 1s. 2d. per lb.

ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.

ACID, TARTARIC.—1s. 3½d. per lb., less 5%.

ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.

AMIDOL.—7s. 6d. to 9s. per lb., d/d.

AMIDOPYRIN.—7s. 9d. to 8s. per lb.

AMMONIUM BENZOATE.—3s. 3d. to 3s. 9d. per lb., according to quantity. 18s. per lb. ex Gum.

AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimed, 1s. per lb.

AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ½ cwt. lots. Packages extra. Special prices for quantities and contracts.

ATROPHINE SULPHATE.—9s. per oz.

BARBITONE.—5s. 9d. to 6s. per lb.

BENZONAPHTHOL.—3s. to 3s. 3d. per lb. spot.

BISMUTH CARBONATE.—7s. 6d. per lb.

BISMUTH CITRATE.—7s. 6d. per lb.

BISMUTH SALICYLATE.—7s. 3d. per lb.

BISMUTH SUBNITRATE.—6s. 6d. per lb.

BISMUTH NITRATE.—Cryst. 5s. per lb.

BISMUTH OXIDE.—9s. 6d. per lb.

BISMUTH SUBCHLORIDE.—9s. 9d. per lb.

BISMUTH SUBGALLATE.—7s. 3d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.

BISMUTH ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 11½d. per lb.; 12 W. Qts. 10d. per lb.; 36 W. Qts. 9d. per lb.

BORAX B.P.—Crystal, £21 per ton; powder, £22 per ton; For one ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.

BROMIDES.—Ammonium, 2s. 6d. per lb.; potassium, 1s. 8d. per lb.; granular, 1s. 5½d. to 1s. 7½d. per lb.; sodium, 1s. 11d. per lb. Prices for 1 cwt. lots.

CALCIUM LACTATE.—B.P., 1s. 1½d. to 1s. 3d. per lb., in 1-cwt. lots.

CAMPHOR.—Refined flowers, 3s. 3d. to 3s. 4d. per lb., according to quantity; also special contract prices.

CHLORAL HYDRATE.—3s. 1d. to 3s. 4d. per lb.

CHLOROFORM.—2s. 4½d. to 2s. 7½d. per lb., according to quantity.

CREOSOTE CARBONATE.—6s. per lb.

ETHERS.—S.G. 730—11d. to 1s. per lb., according to quantity; other gravities at proportionate prices.

FORMALDEHYDE, 40%.—37s. per cwt., in barrels, ex wharf.

GUAIACOL CARBONATE.—4s. 6d. to 4s. 9d. per lb.

HEXAMINE.—2s. 3d. to 2s. 6d. per lb.

HOMATROPINE HYDROBROMIDE.—30s. per oz.

HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.

HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.

HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.

HYPHOSPHITES.—Calcium, 2s. 5d. per lb.; potassium, 2s. 8½d. per lb.; sodium, 2s. 7½d. per lb., in 1 cwt. lots, assorted.

IRON AMMONIUM CITRATE.—B.P., 2s. 8d. to 2s. 9d. per lb. Green, 2s. 10d. to 3s. per lb. U.S.P., 2s. 7d. to 2s. 10d. per lb.

IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.

IRON QUININE CITRATE.—B.P., 8½d. to 9½d. per oz., according to quantity.

MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.

MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.

MENTHOL.—A.B.R. recrystallised B.P., 15s. 9d. per lb. net; Synthetic, 9s. 6d. to 11s. 9d. per lb.; Synthetic detached crystals, 9s. 6d. to 11s. per lb., according to quantity; Liquid (95%), 9s. per lb.

MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb.; Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.

METHYL SALICYLATE.—1s. 3d. to 1s. 5d. per lb.

METHYL SULPHONAL.—18s. 6d. to 20s. per lb.

METOL.—9s. to 11s. 6d. per lb. British make.

PARAFORMALDEHYDE.—1s. 9d. per lb. for 100% powder.

PARALDEHYDE.—1s. 4d. per lb.

PHENACETIN.—3s. 8½d. to 4s. 1d. per lb.

PHENAZONE.—5s. 11d. to 6s. 1½d. per lb.

PHENOLPHTHALEIN.—5s. 11d. to 6s. 1½d. per lb.

POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—103s. per cwt., less 2½ per cent.

POTASSIUM CITRATE.—B.P.C., 2s. 6d. per lb. in 28 lb. lots. Smaller quantities 1d. per lb. more.

POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.

POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.

POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included f.o.r. London.

POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.

QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins.

RESORCIN.—2s. 10d. to 3s. per lb., spot.

SACCHARIN.—43s. 6d. per lb.

SALOL.—2s. 3d. to 2s. 6d. per lb.

SODIUM BENZOATE B.P.—1s. 9d. per lb. for 1-cwt. lots.

SODIUM CITRATE, B.P.C., 1911, AND U.S.P. VIII.—2s. 2d. per lb., B.P.C. 1923, and U.S.P. IX.—2s. 6d. per lb. Prices for 28 lb. lots. Smaller quantities 1d. per lb. more.

SODIUM FERROCYANIDE.—4d. per lb., carriage paid.

SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.

SODIUM NITROPRUSSIDE.—16s. per lb.

SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—100s. per cwt. Crystals, 5s. per cwt. extra.

SODIUM SALICYLATE.—Powder, 1s. 10d. to 2s. 2d. per lb. Crystal, 1s. 11d. to 2s. 1d. per lb.

SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 1d. per lb.

SODIUM SULPHIDE, ANHYDROUS.—£27 10s. to £29 10s. per ton, according to quantity. Delivered U.K.

SULPHONAL.—9s. 6d. to 10s. per lb.

TARTAR EMETIC, B.P.—Crystal or powder, 1s. 9d. to 1s. 10d. per lb.

THYMOL.—Puriss, 7s. 6d. to 8s. 6d. per lb., according to quantity. Firmer. Natural, 12s. per lb.

**Perfumery Chemicals**

ACETOPHENONE.—7s. per lb.

AUBEPINE (EX ANETHOL).—12s. per lb.

AMYL ACETATE.—2s. 6d. per lb.

AMYL BUTYRATE.—5s. per lb.

AMYL CINNAMIC ALDEHYDE.—12s. per lb.

AMYL SALICYLATE.—3s. per lb.

ANETHOL (M.P. 21/22° C.).—6s. 6d. per lb.

BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.

BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. per lb.

BENZYL ALCOHOL FREE FROM CHLORINE.—2s. per lb.

BENZYL BENZOATE.—2s. 6d. per lb.

CINNAMIC ALDEHYDE NATURAL.—13s. 3d. per lb.

COUMARIN.—8s. 3d. per lb.

CITRONELLOL.—10s. per lb.

CITRAL.—8s. per lb.

ETHYL CINNAMATE.—6s. 6d. per lb.

ETHYL PHTHALATE.—2s. 9d. per lb.

EUGENOL.—9s. per lb.

GERANIOL (PALMAROSA).—20s. per lb.

GERANIOL.—7s. 6d. to 10s. per lb.

HELIOTROPINE.—6s. 6d. per lb.

ISO EUGENOL.—11s. 9d. per lb.

PHENYL ETHYL ACETATE.—11s. per lb.

PHENYL ETHYL ALCOHOL.—9s. 6d. per lb.

RHODINOL.—44s. per lb.

SAFROL.—2s. per lb.

TERPINEOL.—1s. 6d. per lb.

VANILLIN, EX CLOVE OIL.—13s. 6d. to 15s. per lb. Ex Guaiacol, 12s. 6d. to 13s. 9d. per lb.

**Essential Oils**

ALMOND OIL.—Foreign S.P.A., 10s. per lb.

ANISE OIL.—4s. 3d. per lb.

BERGAMOT OIL.—11s. 3d. per lb.

BOURBON GERANIUM OIL.—18s. per lb.

CAMPHOR OIL, WHITE.—160s. per lb.

CASSIA OIL, 80/85%.—4s. 9d. per lb.

CINNAMON OIL LEAF.—7s. 9d. per oz.

CITRONELLA OIL.—Java, 2s. 9d. per lb., c.i.f. U.K. port; puie, Ceylon, 2s. 9d. per lb.

CLOVE OIL (90/92%).—6s. 6d. per lb.

EUCALYPTUS OIL, AUSTRALIAN, B.P. 70/75%.—1s. 9d. per lb.

LAVERANDER OIL.—Mont Blanc, 38/40%, 11s. 6d. per lb.

LEMON OIL.—5s. 3d. per lb.

LEMONGRASS OIL.—4s. per lb.

ORANGE, SWEET.—11s. 3d. per lb.

PEPPERMINT.—12s. 6d. per lb.

## London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, April 2, 1930.

THE market has been without any special feature during the current week, the demand being about equal to previous weeks. Prices continue steady. Export business has been slightly better.

### General Chemicals

ACETONE.—Firm at £71 10s. to £80 per ton, with the demand fair.  
ACETIC ACID.—Continues to be in good request at £36 10s. for 80% technical and £37 10s. for 80% edible.  
ACID CITRIC.—The demand has been very small and price is a shade easier at about 1s. 9½d. per lb., less 5%.  
ACID LACTIC.—In fair request at £43 per ton for 50% by weight, pale quality.  
ACID OXALIC.—The market is firm at £30 7s. 6d. to £32 per ton according to quantity, and quite a brisk demand has been received.  
ALUMINA SULPHATE.—Firm at £8 to £8 15s. per ton for 17.18% iron free quality, and there is a good demand.  
ARSENIC.—Only in very small demand and price is a shade easier at about £16 per ton, free on rails at mines.  
BORAX.—Demand is increasing and the price is maintained.  
CREAM OF TARTAR.—A rather easier tendency has been noticed recently and there is a small trade passing at about £5 per cwt.  
COPPER SULPHATE.—In good demand with prices slightly firmer.  
FORMALDEHYDE.—Steady at £35 per ton.  
LEAD ACETATE.—Quoted at about £41 10s. for white, and £40 10s. for brown, with a little better demand.  
LEAD NITRATE.—Only in small request at about £33 per ton.  
LIME ACETATE.—Without special feature.  
LITHOPONE.—In fair request at £19 15s. to £23 per ton according to grade.

### Nitrogen Fertilisers Market

*Sulphate of Ammonia—Export.*—Although the demand on the Continent continues to be in excess of that of last year, stocks available are not diminishing rapidly, and the price is easier at £8 per ton, f.o.b. U.K. port, in single bags. *Home.*—Most merchants report a slackening of activities on account of the dangers of giving credit extensively to their customers. It appears, therefore, that this year's consumption of ammonium sulphate will show a decline on that of 1928-29.

*Nitrate of Soda.*—Nitrate sales in the U.K. appear to be smaller than last year. This is due to the same causes as that of the apparent decline in sales of sulphate.

### Latest Oil Prices

LONDON, April 2.—LINSEED OIL was steady, ex mill, £40 5s.; April, £38 12s. 6d.; May-August, £37 17s. 6d.; and September-December, £37 10s., naked. RAPE OIL was firm. Crude extracted, £37; technical refined, £38 10s., naked, ex wharf. COTTON OIL was steady. Egyptian crude, £28; refined common edible, £32 10s.; and deodorised, £34 10s., naked, ex mill. TURPENTINE was firm and 3d. per cwt. higher. American, spot, 44s. 6d.; May-June, 44s. 9d.; and Russian, spot, 41s.

HULL.—LINSEED OIL.—Spot, £40 5s.; April, £39 10s.; May-August, £38 7s. 6d.; September-December, £38 per ton, naked. COTTON OIL.—Egyptian, crude, spot, £28 15s.; edible refined, spot, £31 10s.; technical, spot, £31; deodorized, spot, £33 10s. PALM KERNEL OIL.—Crude, naked, 5½ per cent., spot, £31 10s. GROUND-NUT OIL.—Crushed-extracted, spot, £33; deodorized, spot, £37. SOYA OIL.—Extracted, spot, £30 10s.; crushed, spot, £30 10s.; deodorized, spot, £34. RAPE OIL.—Crushed-extracted, spot, £36; refined, spot, £38 per ton. TURPENTINE.—Spot, 47s. per cwt., net cash terms, ex-mill.

### South Wales By-Products

BUSINESS in South Wales by-products remains quiet. Pitch continues to have a slow market, available supplies being far in excess of demand. Patent fuel manufacturers are buying very little, while other buyers appear to be holding off for a fall in values. Naphthas are unchanged, solvent having a steady, but moderate, call at from 1s. 3d. to 1s. 5d. per gallon, while heavy is slow at from 11d. to 1s. 1d. per gallon. Road tar has a slightly better call with values unchanged at from 10s. to 12s. per 40-gallon barrel. Refined tars are not quite so brisk, values for coke-oven and gasworks tar being unchanged. Creosote has a poor call at from 2½d. to 3½d. per gallon, but motor benzol is in good demand with prices unchanged. There is a slightly better call for sulphate of ammonia at a steady quotation of £10 2s. per ton. Patent fuel and coke exports continue to be moderate. Patent fuel prices for export

POTASSIUM CARBONATE.—Slightly firmer at about £27 per ton for 96.98% arsenic free quality.  
PERMANGANATE OF POTASH.—In good general demand at about 5½d. per lb. for the B.P. crystal quality.  
SODIUM ACETATE.—Unchanged at £21 10s. to £22 per ton.  
SODIUM BICHROMATE.—Firm at 3½d. per lb., and in good request.  
SODIUM HYPOSULPHITE COMMERCIAL CRYSTALS.—Demand is somewhat better and the market is firm at £8 10s. to £9 per ton. Photographic crystals, £14 15s. per ton, with a brisk demand.  
SODIUM NITRITE.—Steady at about £20 per ton.  
SODIUM PRUSSIAN.—Unchanged at 4½d. to 5½d. per lb., and in fair request.  
SODIUM SULPHIDE.—Demand has been a little better and prices are firm at British makers' prices.  
TARTAR EMETIC.—Unaltered at 11d. per lb.  
ZINC SULPHATE.—In little better demand at £13 per ton.

### Coal Tar Products

The coal tar products market is still quiet and uninteresting, and prices are unchanged from last week.

MOTOR BENZOL.—Remains at about 1s. 5½d. to 1s. 6d. per gallon f.o.r.  
SOLVENT NAPHTHA.—Unchanged at about 1s. 2½d. to 1s. 3d. per gallon f.o.r.  
CREOSOTE OIL.—Unchanged, at 3d. to 3½d. per gallon f.o.r. in the North, and at 4d. to 4½d. per gallon in London.  
CRESYLIC ACID.—Quoted at 2s. per gallon for the 98/100% quality, and at 1s. 10d. per gallon, ex works, for the dark quality 95/97%.  
NAPHTHALENES.—The firelighter quality is quoted at £3 10s. to £3 15s. per ton, the 74/76 quality at £4 to £4 5s. per ton, and the 76/78 quality at about £5 per ton.  
PITCH.—A steady market, at 45s. to 47s. 6d. per ton f.o.b. East Coast Port.

are:—22s. 6d. per ton, ex-ship Cardiff; from 1s. 6d. to 2s. 6d. less, ex-ship Swansea and Newport. Coke quotations for foundry and furnace grades are unchanged at all South Wales ports.

### Scottish Coal Tar Products

THERE is a quietness pervading this market at present and orders for most products are scarce. Cresylic acid is probably the best item of the group so far as distillers are concerned and prices tend upwards.

*Cresylic Acid.*—Quotations are firm and inclined to rise. Prompt supplies remain scarce. Pale 99/100%, 1s. 11d. to 2s. per gallon; pale 97/99%, 1s. 10d. to 1s. 11d. per gallon; dark 97/99%, 1s. 8½d. to 1s. 9½d. per gallon; all free on rails works. High boiling acid remains at about 1s. 9½d. to 1s. 11½d. per gallon.

*Carbolic Sixties.*—The value is steady at 2s. 4d. to 2s. 5d. per gallon for ordinary quality containing up to 15% water.

*Creosote Oil* is accumulating and quotations are weak as follows:—Specification oil, 3d. to 3½d. per gallon; gas works ordinary, 2½d. to 3½d. per gallon; washed oil, 3d. to 3½d. per gallon; all at works naked.

*Coal Tar Pitch.*—Very little is being made in this area and stocks are low. Nominal value is about 47s. 6d. per ton f.a.s. Glasgow. Home trade price is about 50s. to 52s. 6d. per ton, ex works.

*Blast Furnace Pitch.*—The production continues to be greater than the demand, but controlled prices remain at 30s. per ton f.o.r. works for home trade and 35s. per ton f.a.s. Glasgow for export.

*Refined Coal Tar.*—Considerable business is passing at 3½d. to 4½d. per gallon f.o.r. works in buyers' packages.

*Blast Furnace Tar* is dull at 2½d. per gallon.

*Crude Naphtha.*—The tendency is lower at 4½d. to 5½d. per gallon according to quality.

*Water White Products* are weak and quotations for solvents are lower. 90/160 is 1s. 2d. to 1s. 2½d. per gallon and 90/190 is 1s. to 1s. 0½d. per gallon. Motor benzole continues to be quoted at 1s. 6½d. to 1s. 6¾d. per gallon.

### Federation of British Industries

THE annual general meeting of the Federation of British Industries will be held on Wednesday next, at the Institution of Mechanical Engineers, London. The chief business will be to elect a president in place of Mr. Lennox B. Lee, who has held this office for the past twelve months, and the name of Sir James Lithgow has been put forward. The meeting will also be asked to re-elect the vice-presidents and to elect two new ones in the persons of Sir Arthur Duckham and Sir Hugo Hirst.



## Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing this firm's independent and impartial opinions.

Glasgow, April 2, 1930.

THE Scottish heavy chemical market continues to be very quiet, and there is little expectation of any increase in business during the next week or so. Prices on the whole remain practically on the same level as last reported.

### Industrial Chemicals

ACETONE, B.G.S.—£71 10s. to £80 per ton, ex wharf, according to quantity. Inquiry remains satisfactory.

ACID ACETIC.—This material is still scarce for immediate supply, but prices remain unchanged as follows:—98/100% glacial, £56 to £67 per ton, according to quality and packing, c.i.f. U.K. ports. 80% pure, £37 10s. per ton, ex wharf; 80% technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystals, granulated or small flakes, £30 per ton; powder, £32 per ton, packed in bags, carriage paid U.K. stations. There are a few fairly cheap offers made from the Continent.

ACID CARBOLIC, ICE CRYSTALS.—Quoted 8d. per lb., delivered.

ACID CITRIC, B.P. CRYSTALS.—Quoted 2s. per lb., less 5% ex store, prompt delivery. Rather cheaper offers for early delivery from the Continent.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy; dearsenicated quality, 5s. 6d. per carboy, ex works, full wagon loads.

ACID NITRIC, 80% QUALITY.—£24 10s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—On offer at same price—viz., 3½d. per lb., ex store. Offered from the Continent at 3½d. per lb., ex wharf.

ACID SULPHURIC.—£2 15s. per ton, ex works, for 114° quality, £5 15s. per ton for 168°. Dearsenicated quality 20s. per ton extra.

ACID TARTARIC, B.P. CRYSTALS.—Quoted 1s. 4d. per lb., less 5%, ex wharf. On offer for prompt delivery from the Continent at 1s. 4½d. per lb., less 5% ex wharf.

ALUMINA SULPHATE.—Quoted at round about £7 10s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 7s. 6d. per ton, c.i.f. U.K. ports. Crystal meal about 2s. 6d. per ton less.

AMMONIA, ANHYDROUS.—Quoted 7½d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton; powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 88°.—Unchanged at about 2½d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture, quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Rather easier, and spot material now obtainable at round about £34 per ton, ex wharf. On offer for prompt shipment from China at about £30 per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Quoted £18 per ton, ex wharf, prompt dispatch from mines. Spot material still on offer at £19 15s. per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £11 per ton, c.i.f. U.K. ports. For Continental material our price would be £10 per ton, f.o.b. Antwerp or Rotterdam.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 12s. 6d. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 15s. per ton to £5 5s. per ton, according to quantity and point of delivery. Continental material on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works or £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Now quoted £35 per ton, ex store. Continental material now on offer at about £34 per ton, ex wharf.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 5s. per ton, ex wharf.

LEAD, RED.—Price now £37 10s. per ton, delivered buyer's works.

LEAD, WHITE.—Quoted £37 10s. per ton, c.i.f. U.K. ports.

LEAD ACETATE.—White crystals quoted round about £39 to £40 per ton, ex wharf. Brown on offer at about £2 per ton less.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store, in moderate demand.

METHYLATED SPIRIT.—Industrial quality 64 O.P. quoted 1s. 4d. per gallon, less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4½d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance for contracts.

POTASSIUM CARBONATE.—Spot material on offer at £26 10s. per ton, ex store. Offered from the Continent at £25 5s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99½/100%.—Powder quoted £25 10s. per ton, ex wharf. Crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 5½d. per lb., ex wharf.

POTASSIUM PRUSSIAN (YELLOW).—Spot material quoted at 7d. per lb., ex store. Offered for prompt delivery from the Continent at about 6½d. per lb., ex wharf.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3½d. per lb., delivered buyers' premises, with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality 27s. 6d. per ton extra. Light soda ash £7 13s. per ton, ex quay, minimum 4-ton lots, with various reductions for contracts.

SODIUM CAUSTIC.—Powdered, 98/99%, £17 10s. per ton, in drums, £18 15s. per ton in casks. Solid, 76/77%, £14 10s. per ton in drums; £14 12s. 6d. per ton for 70/72% in drums, all carriage paid buyers' stations, minimum 4-ton lots. For contracts 10s. per ton less.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum 4-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum 4-ton lots. Prices for this year unchanged.

SODIUM NITRATE.—Chilean producers are now offering at £10 2s. per ton, carriage paid buyers' sidings, minimum 5-ton lots, but demand in meantime is small.

SODIUM PRUSSIAN.—Quoted 5½d. per lb., ex store. On offer at 5d. per lb., ex wharf, to come forward.

SODIUM SULPHATE (SALTCAKE).—Prices 55s. per ton, ex works; 57s. 6d. per ton, delivered, for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption. Solid, 60/62%, £9 15s. Broken, 60/62%, £10 15s. per ton. Crystals, 30/32%, £7 17s. 6d. per ton, all delivered buyers' works on contract, minimum 4-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £9 5s. per ton; ground American, £9 5s. per ton, ex store.

ZINC CHLORIDE, 98%.—British material offered at round about £20 per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £10 per ton, ex wharf.

NOTE.—The above prices are for bulk business, and are not to be taken as applicable to small parcels.

### Annual Report of the John Benn Hostel

THE John Benn Hostel, in the East End of London, has another successful year of work behind it, and the report of the Warden for 1929 makes good reading. Here is salvaged part of the immense amount of valuable, but too often wasted, material among the youths of the East End. With seventy-five boys the Hostel now has its full complement. Employment among the lads is satisfactory, and with hardly an exception they are placed in positions that offer the prospect of future development. Their jobs are not merely blind alleys with the inevitable outcome of unemployment after a year or two. Many boys are apprenticed to various crafts and trades, but still more interesting is the exceptional talent to which the Hostel life offers scope. At present two of the boys are studying for matriculation. One hopes to take Orders and the other to distinguish himself as a chemist. Another boy is learning advertising photography, while studies for the Chartered Institute of Secretaries and for proficiency in commercial art are occupying two clever youngsters. Meanwhile, the work of social recreation carried out in the Milner Hall goes on daily and successfully and commands the steady support of large numbers of Stepney people. The East End Hostels Association (of which Sir Ernest Benn is the president) is emphatically an organisation deserving the support, on the highest patriotic as well as compassionate grounds, of the charitably minded. The annual meeting was held last week.

## Manchester Chemical Market

(FROM OUR OWN CORRESPONDENT.)

Manchester, April 3, 1930.

CONDITIONS in the chemical market locally during the past week have not been too good. On the whole there is not much complaint as to the rate at which existing contracts are going into consumption, delivered specifications being fairly satisfactory. The trouble, in many instances, is that at the moment the flow of new business is not sufficient to replace the orders that are being completed or approaching that stage, although there is still some inquiry on the market relating to moderate quantities of material on prompt and early delivery account. With regard to prices, with one or two outstanding exceptions quotations are generally steady.

### Heavy Chemicals

The demand for phosphate of soda this week has been of rather limited extent, but values of this are well held at about £11 10s. per ton for the dibasic quality. Chlorate of soda meets with a moderate amount of inquiry and prices keep up at from £25 to £27 per ton, ex store and according to quantity. Caustic soda continues to attract a fair volume of buying interest and deliveries of this material are said to be on a steady scale; contract quotations range from £12 15s. to £14 per ton, according to quality. A quiet business is going through in the case of saltcake, offers of which are at £2 15s. to £3 per ton, with Glaubers salts in much the same position at about £2 15s. Bichromate of soda is attracting a fair amount of attention and offers of this are very firm at 3½d. per lb., less 1 to 2½ per cent. discount according to quantity. With regard to sulphide of sodium, a quiet trade is passing at about £8 per ton for the commercial strength and from £9 10s. to £10 for the 60-65 per cent. concentrated solid quality. Bicarbonate of soda is firm and in moderate request at £10 10s. per ton, in contracts. Hyposulphite of soda is rather slow, with the commercial grade selling at about £9 5s. per ton and the photographic at £15 10s. Alkali is steady at £6 per ton with buying interest on moderate lines.

There is only a quiet demand about in the case of permanganate of potash, but values in this section are much the same as before, the B.P. material being quoted at 5½d. per lb. and the commercial at about 5½d. A steady business is being done in yellow prussiate of potash, prices of which are fully maintained at from 6½d. to 7½d. per lb., according to quantity. Chlorate of potash is not attracting a great deal of attention at the moment, but quotations keep up at from £26 to £28 per ton. Current offers of caustic potash are at round £31 per ton, a moderate trade being put through. Carbonate of potash is selling in fair quantities, and prices are steady at £26 5s. per ton. A quietly steady demand is reported in the case of bichromate of potash, which keeps very firm on the basis of 4½d. per lb.

Sulphate of copper is steady in tone at from £26 5s. to £26 15s. per ton, f.o.b., but the demand on this market at the moment is not particularly active. Arsenic is quiet and somewhat easy in tendency, current offers ranging from about £15 15s. to £16 per ton at the mines for white powdered, Cornish makes. There has been no further price change in the lead products, a quiet demand being reported at round £32 per ton for nitrate and £37 and £38 per ton for brown and white acetate. The acetates of lime are attracting a moderate amount of attention and prices seem to be reasonably steady at about £7 10s. per ton for the brown material and £15 10s. per ton for the grey.

### Acids and Tar Products

Among the acid products, citric continues to show a certain amount of ease and only a quiet demand has been experienced this week at from 1s. 8½d. to 1s. 9d. per lb., little change being reported in the case of tartaric at round 1s. 3d. per lb. There is a steady inquiry about for acetic acid at firm prices, glacial being quoted at £66 per ton and 80 per cent. commercial at £36. With regard to oxalic acid, prices are steady at £1 12s. 6d. per cwt., ex store, although the demand has not been extensive.

The by-products market has not been at all active. Pitch is rather slow with values unchanged at about 47s. 6d. per ton, f.o.b. Creosote oil is a relatively quiet section at from 3½d. to 4d. per gallon, naked. Solvent naphtha is steady at about 1s. 2½d. per gallon and a moderate demand is reported. Carbolic acid is in fair request at 2s. 5d. per gallon, naked, or 60's crude, and 7½d. per lb., f.o.b., for crystals.

## Company News

**BOOTS PURE DRUG CO.**—A quarterly dividend is announced at the rate of 24 per cent. per annum, payable forthwith.

**UNITED ALUMINIUM WORKS.**—It is announced that this well-known German concern has declared a dividend for 1929 of 9%.

**BRITISH OIL AND CAKE MILLS.**—The directors announce a final dividend of 7½ per cent. on the preferred ordinary shares, making 12½ per cent.

**RIO TINTO CO.**—A final dividend is announced on the ordinary shares of 25 per cent., and the payment of a bonus for the year of 5 per cent., making a total distribution for the year of 55 per cent. The sum of £203,651 is carried forward.

**INDESTRUCTIBLE PAINT AND STANDARD VARNISH, LTD.**—The accounts for 1929 show a net profit of £35,350, in addition to which £3,483 was brought forward and profits amounting to £7,442 arose from the sale of shares. The amount to be carried forward is £4,190.

**MINERALS SEPARATION.**—The profit and loss account for the year 1929 shows a credit balance amounting to £60,016, as against £58,599 for the previous year. After providing for dividends and directors' remuneration, there remains £7,515 (subject to tax) to be carried forward.

**CHEMICAL AND METALLURGICAL CORPORATION.**—It is announced that the board regret it was not possible to complete the accounts in time to hold the annual meeting during March, but it is hoped that the directors' report and accounts will be sent to shareholders in the first week in April.

**THARSIS SULPHUR AND COPPER CO.**—The full report for the year 1929, which has just been issued, states that the net profit on operations was £182,739, and balance brought in was £82,139, making a total of £264,878. A sum of £115,000 is transferred to general reserve, and payment of 12½ per cent., less tax, on the ordinary capital requires £125,000, leaving to carry forward £24,878.

**BROKEN HILL SOUTH.**—The interim report for the half-year ended December 31, 1929, shows estimated revenue from treatment of crude ore (including proportion of realisations from production of previous periods), also from interest, dividends and sundry income, £510,000; working and administration expenses, debenture interest, depreciation, provision for taxes, royalty and redemption of debentures, £356,000; estimated surplus for the half-year, £154,000. The surplus for the corresponding period last year was £140,000.

**BRITISH TINTEX AND DYE PRODUCTS.**—The report for the first period's trading to December 31, 1929, shows a debit of £5,124. In respect of subsidiary companies a loss of approximately £2,700 has been sustained by one company; the accounts of the other company have not yet been completed, but the directors anticipate that it will show a profit. In submitting the report, the directors point out that in the period the company's working plans have necessarily been influenced by exigencies and interrupting factors which are always present to a certain degree in launching of a new product. They feel, however, quite justified in stating that a great deal has been accomplished during the period of development of the company in establishing sound goodwill.

## Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

**CHILE.**—The Commercial Secretary, His Majesty's Legation, Santiago, has reported that the Chilean State Railways department is inviting tenders for the supply of the following materials: hydrochloric acid; nitric acid; sulphuric acid; pure alcohol (40°); ammonia; borax; liquid disinfectant; barium chloride; ferro-prussiate; liquid insecticide; caustic soda, petroleum jelly. Tenders will be received at the Departments de Almacenes y Materiales of the State Railways, Alameda Station, Santiago, up to May 7. (Reference No. C. X3230.)

# You need

sound fire protection if, when that outbreak of fire occurs, prompt extinguishment is to be assured. To have fire extinguishers at hand is not sufficient unless they are of the right type for the risk which they protect. An appliance may be suitable, from every point of view, for installation in an office, but it may be worse than useless in another part of the works.

There is a unit of Foamite Protection for every risk, no matter what the nature, and Foamite Engineers will, without obligation, survey premises and make recommendations.

Send to Foamite Firefoam, Ltd., 55/57, Gt. Marlborough St., London, W.1, for a free copy of the illustrated booklet, "Safeguarding Your Property."

## Foamite Protection

Telephone: Regent 3105/6/7.  
Telegrams: Foamite, Wesdo, London.



## Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

### County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

GRAY, George, and Sons, Lever Street, Bury, wholesale druggists. (C.C., 5/4/30.) £12 15s. February 21.

FONODORISER CHEMICAL CO., LTD., Fonodoriser House, Harvey Road, S.E., chemical manufacturers. (C.C., 5/4/30.) £13 2s. 1d. January 22.

### Mortgages and Charges

[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an \*—followed by the date of the Summary, but such total may have been reduced.]

BRITISH-NETHERLANDS ARTIFICIAL SILK CO., LTD., London, S.W. (M., 5/4/30.) Registered March 21, £13,800 charge, to Caton and Duckworth, William Henry Street Sawmills, Blackburn, and another; charged on property at Station Road, Wigton, etc.

CHEMICAL AND METALLURGICAL CORPORATION, LTD., London, E.C. (M., 5/4/30.) Registered March 21, £100,000 notes; general charge. \*Nil. May 29, 1929.

ENDOCRINES, LTD., London, W., manufacturers of medicinal preparations. (M., 5/4/30.) Registered March 20, series of £5,000 debentures, present issue £500; first general charge (excepting factory and land at Watford, on which it is a second charge). \*Nil. March 31, 1929.

FISON, PACKARD AND PRENTICE, LTD., Ipswich, chemical manufacturers. (M., 5/4/30.) Registered March 21, by order on terms, £34,500 debentures, (sec. 81, 1929 Act); charged on Eastern Union Chemical Works, Bramford, and undertaking, etc., of Joseph Fison and Co., Ltd. (in liquidation); also registered March 21, by order on terms, two charges (sec. 81, 1929 Act), collaterally securing £34,500 debentures; charged as above and land and buildings at Ipswich. \*£68,800. September 12, 1929.

VERITY (ARTHUR) AND JOHN TURNER, LTD. (late JOHN TURNER OF CALDER DALE, LTD.), Sowerby Bridge, oil distillers. (M., 5/4/30.) Registered March 20, £1,000 debenture to West Croft Estate Co., Ltd., Permanent Chambers, Hull; general charge; also registered March 20, £5,000 debentures; general charge. \*Nil. October 18, 1928.

### Satisfaction

BEAU BRUMMEL (1928), LTD., London, E.C., dyers and cleaners. (M.S., 5/4/30.) Satisfaction registered March 19, all moneys, etc., registered March 11, 1929 (two charges).

### New Companies Registered

BRUZAC HYDRO-CARBON PROCESSES, LTD., Dashwood House, 60, Old Broad Street, London, E.C.2.—Registered as a "private" company on March 31. Nominal capital, £10,000 in 8,000 ordinary shares of £1 each and 40,000 deferred shares of 1s. each. To adopt an agreement with the Anglo-Foreign Oil and General Trust, Ltd., M. Mercurio and A. Bruzac, and to carry on the business of distillers, extractors, producers, manufacturers and suppliers of benzol and other hydro-carbons, and all solid, liquid and gaseous substances or matter derived from coal or from the derivatives of or residuals obtained from coal by combustion, evaporation, distillation or decomposition, or by any other process, whether physical, mechanical or chemical, manufacturers of and dealers in fuel for domestic, industrial and other purposes, tar, sulphate and other forms of ammonia, oils, chemicals, etc. A subscriber:

J. L. O'Connor, Brandfold, Goudhurst, Kent. The first directors shall be two persons appointed by the Anglo-Foreign Oil and General Trust, Ltd., and others to be appointed by the subscribers.

COMMERCIAL SUPPLIES SYNDICATE, LTD. Registered March 29. Nominal capital, £1,000 in 850 ordinary shares of £1 each and 3,000 deferred shares of 1s. each. To adopt an agreement with G. A. Payne, and to carry on the business of general manufacturers and salesmen, textile manufacturers, makers of artificial silk, research and manufacturing chemists, dyers, cleaners, bleachers, soapmakers, etc. A director: G. A. Payne, 43, Eltham Road, West Bridgford.

KIRKWOOD, CRAIG AND CO., LTD., Eighth Avenue Works, Manor Park, London, E.12.—Registered March 25. Nominal capital, £10,000 in £1 shares (8,900 5 per cent. cumulative preference and 1,100 ordinary). To acquire the business carried on by Kirkwood, Craig and Co., Ltd., at Eighth Avenue Works, Manor Park, and Forest Road, Fairlop, Essex, and to carry on the business of manufacturers of and dealers in adhesives, chemical products, cleaning and polishing materials, paints, enamels and painters' requisites, etc. Directors: A. W. Collier, Fairmeadside, Warren Hill, Loughton Essex.; A. Mitchell, F. H. Schooling, R. A. Watson, and Annie E. Collier.

### Tariff Changes

BELGIUM.—A Royal Order of February 20 subjects eucodal, dicodide, dilauidide and all morphine esters to the control of the trade in narcotics which was instituted in Belgium in 1921. These products will therefore require a licence in order to be imported into or exported from Belgium.

GREECE.—The Customs duties on sesame oil, cottonseed oil, groundnut oil and other edible fixed oils not specified in the Greek Customs Tariff have recently been increased from 40 to 50 gold drachmæ per 100 kilograms, under the "Maximum" Tariff, and from 30 to 40 gold drachmæ per 100 kilograms, under the "Minimum" Tariff (which is applicable to imports from the United Kingdom). The tax on seed oils produced in Greece has also been increased.

SALVADOR.—The import duties on chloride of barium and hypochlorite of calcium have been reduced, and a new heading has been raised for technical or impure muriatic (hydrochloric) acid for industrial use.

SPAIN.—By virtue of a Royal Decree of February, 1924, all pharmaceutical specialties, sera, vaccines, opotherapeutic products, and disinfectants must be registered with the Public Health Department (Direction of General Health) before being placed on sale in Spain. A recent Royal Order notifies that a fresh registration is necessary when any modification is made in the name or composition of the original preparation. When modifications are made in any other respects (e.g., as regards sale price to the public) the competent authorities must be notified, in order that they may decide whether or not renewed registration is necessary.

### American Duties on Chemicals

THE United States Senate proposes to retain the American valuation basis for duties on coal tar products and make many changes in the rates on chemical products on final consideration of the proposed tariff bill. The suggested new rates are as follows:

Acetic anhydride, 2½ cents per pound; acid formic, 25 per cent. ad valorem; acid phosphoric, 2 cents per pound; acetone, 20 per cent.; ethylmethylketone, 20 per cent.; aluminium sulphate, containing not more than 15 per cent. alumina and more iron than 1/10 of one per cent. of ferric oxide, 1/5 cent per pound; synthetic gums and resins not specifically provided for, 25 per cent.; whiting, 25 per cent.; magnesium oxide, 5 cents per pound; collodion and other liquid solutions of pyroxylin, 30 cents per pound; synthetic camphor, 5 cents per pound; menthol, 30 cents per pound; sodium bicarbonate, free; borax, free; sodium formate, 2 cents per pound; sodium oxalate, 25 per cent.; soda ash, free; sodium hyposulphite, one cent per pound; formaldehyde solution, 1½ cents per pound; litharge, 2½ cents per pound; red lead, 2½ cents per pound; carbon black, 15 per cent.; lithopone, 1½ cents per pound; vermilion reds, 35 cents per pound; sodium sulphate, anhydrous, \$2 ton; egg albumen, 60 cents per pound; egg yolk, 30 cents per pound.

